DOCUMENT RESUME

ED 240 965 HE 017 078

TITLE	Proceedings, 1983 Annual Meeting, Southern Regional Education Board (Palm Beach, Florida, June 9-11, 1983).
INSTITUTION	Southern Regional Education Board, Atlanta, Ga.
PUB DATE	Jun 83
NOTE	151p.
AVAILABLE FROM	Southern Regional Education Board, 1340 Sixth Street, N.W., Atlanta, GA 30313.
PUB TYPE	Collected Works - Conference Proceedings (021) -- Reports - Descriptive (141)
EDRS PRICE	MF01/PC07 Plus Postage.
DESCRIPTORS	*Academic Standards; College Admission; *College School Cooperation; Economic Development; *Educational Quality; Education Work Relationship; Geographic Regions; Graduation Requirements; Higher Education; Master Teachers; Mathematics Education; Public Education; Science Education; Teacher Education; *Teacher Effectiveness; *Technological Advancement; Vocational Education
IDENTIFIERS	North Carolina; Tennessee; Texas (Houston); *United States (South)

ABSTRACT

Proceedings of the 1983 annual meeting of the Southern Regional Education Board (SREB) are presented. Contents include a roundtable discussion, nine papers, a progress report by the SREB's Task Force on Higher Education and the Schools, a presentation on a SREB report on higher education and high technology economic development, a summary of the overall meeting, a meeting agenda, a roster of participants, meeting minutes, the president's report, and minutes of the SREB executive committee meeting. Recommendations are offered concerning: raising high school academic standards and graduation requirements, raising college admissions standards, improving teacher selection, teacher education and certification; mathematics and science education; and vocational education. The text of a roundtable discussion on programs to improve quality and provide new incentives for teachers is provided, along with a summary of the project "Meeting the Need for Quality: Action in the South." Additional contents address the following topics: the Tennessee Master Teacher Program, the Charlotte-Mecklenburg School Plan, the Houston Independent School District Plan, the role of universities, the state role, institutional and state responses to challenges of high technology, and skills for the work place. (SW)

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SUMMARY OF 1983 ANNUAL MEETING
OF THE SOUTHERN REGIONAL EDUCATION BOARD

The Southern Regional Education Board met June 9-11, 1983, at The Breakers in Palm Beach, Florida.

The Finance and Executive Committees met the afternoon of June 9. That evening Dr. S. John Davis, State Superintendent of Public Instruction, Virginia, and Chairman of the SREB Task Force on Higher Education and the Schools, presented a progress report to the Board on the concluding report, Meeting the Need for Quality: Action in the South.

At a breakfast meeting for Board members on June 10, Governor William F. Winter, SREB Chairman, presided over the annual business session.

In his report to the Board, President Godwin called on the Board to endorse the Task Force report, Meeting the Need for Quality: Action in the South, and commend it to the region as a platform for quality improvements in education and further recommended that the Board reaffirm its commitment to stronger ties between higher education and the schools for the purpose of improved quality. The Board voted to approve the President's recommendations.

The Board approved the report of the Executive Committee, presented by Chancellor Vernon D. Crawford, SREB Vice-Chairman, including an operating budget of $3,255,000 for 1983-84; a directive to staff to explore the most appropriate kind of advisory structure at SREB to help assure sound program direction consistent with interest of the states on changing conditions in health and human

service fields and their impact on health professions education; a resolution of appreciation to Governor Joe Frank Harris of Georgia and President Joseph Pettit of Georgia Institute of Technology for their efforts to secure a replacement facility for SREB in Atlanta on the Georgia Tech campus; and study of a request from Meharry Medical College for a fee increase in medical and dental contracts.

The Board elected Governor Lamar Alexander of Tennessee as Chairman for 1983-84, Senator Arthur Dorman of Maryland as Treasurer, and re-elected Chancellor Vernon D. Crawford of Georgia as Vice-Chairman.

Governor Bob Graham of Florida addressed the Board on the need for interstate initiatives in drug education. He commended the Board for the fact that SREB, in his view, had always interpreted the "E" of its formal name in a broad and flexible fashion, and expressed pleasure that SREB staff was considering possible new steps in drug education that would increase public awareness of the dangers of drug use.

In other business brought before the Board, Dr. John T. Casteen III of Virginia urged members of the Board to support the National Nuclear Science Advisory Committee's recommendation to the U. S. Secretary of Energy that the FY 1984 budget of the Department of Energy include funds to support construction of the National Electron Accelerator Laboratory under sponsorship of the Southeastern Universities Research Association (SURA). The Board authorized preparation of a resolution in support of the SURA/NEAL proposal and its transmittal to members of Congress.

Governor Winter presided over the first general session on June 10 on "Programs to Improve Quality: New Incentives for Teachers." Dr. Winfred L. Godwin, SREB President, moderated a roundtable discussion which included Governor Lamar Alexander and Tennessee legislators: Representative Steve Cobb, Senator James E. Elkins, Representative James M. Henry, and Representative Dale Kelley. Also included were Dr. Billy R. Reagan, Superintendent, Houston, Texas, Independent School District, and Dr. Jay M. Robinson, Superintendent, Charlotte-Mecklenburg, North Carolina, School System. The discussion focused on financial incentives for teachers. Governor Alexander and the Tennessee delegation described the Tennessee "master teacher" proposal. Governor Alexander, citing the need to reward excellent teachers, said, "No state public school system pays one teacher one penny more for doing a good job at what they were hired to do. It is the most indefensible public policy in our country today. The blame for the condition of our schools lies with our governors, our legislatures, and our school boards." The Tennessee plan, he said, is designed to call a halt to the current perception that the teaching profession is a "financial dead-end career."

Representative Cobb outlined details of the "master teacher" plan and addressed some of its alleged problems, including eligibility and protection of present teachers. Senator Elkins and Representatives Henry and Kelley gave their view on the proposal and its application within their districts.

Superintendent Robinson emphasized that the Charlotte-Mecklenburg plan was not in response to "a crisis situation," but was to forestall what might

become "very serious trouble in the near future." He said that the Charlotte "career ladder" plan is a way to attract good recruits, to train them in a 4- to 6-year probationary period, then to tenure only teachers that have met training requirements and have demonstrated excellent performance over a substantial period of time. Pay incentives are linked to achievement of the progressive steps. He stressed the role of staff development training tailored to needs of the teachers.

Superintendent Reagan presented data on improvements in student attendance and scholastic achievement to document the success of Houston initiatives in merit pay. The Houston plan, which has been operating for several years, establishes criteria for evaluation and provides stipends for teachers in inner-city schools and in areas of critical shortage. "The center point of the plan," said Mr. Reagan, "is outstanding educational progress."

Luncheon meetings were held on June 10 for members of the Board and Legislative Advisory Council to discuss the report of the Task Force on Higher Education and the Schools.

Governor Winter presided over the afternoon session at which Dr. Charles Minshall of Battelle Institute, Columbus, Ohio, gave a presentation of the SREB report: Higher Education and High Technology Economic Development. Dr. Minshall, author of the forthcoming report commissioned by SREB from Battelle, outlined characteristics of a "high tech" industry and stressed that universities with strong engineering programs play a critical role in stimulating high technology development. He said that high technology industry tends to blossom

in areas where people like to live and areas with cultural attractions, good neighborhoods, and good schools.

Governor Bob Graham of Florida and Governor Charles S. Robb of Virginia gave their views on "The State Role in High Technology Development." Governor Graham described three ways in which education affects the location of a high tech industry--the quality of the public schools, the availability of a suitably trained work force, and the provision of continuing education for scientists, engineers, and managers. Governor Graham said, "I know of no greater contribution that the universities could make to the expansion of high technology than to be serious about the business of assisting in improving public schools."

Governor Robb talked about the concentration of high technology firms in northern Virginia, close to Washington, D. C. He said that this area probably has all of the components of a site for high tech industry except the key one--the proximity of a front-ranked research and engineering university. Governor Robb said that a forthcoming report from a state task force on science and technology will "tell us what we have...and then tell us what to do."

The general session on June 11, "Institutional and State Responses to Challenges of High Technology," was presided over by Chancellor Crawford. D. S. Beilman, President of the Microelectronics Center, Research Triangle Park, North Carolina, in his presentation said that the development of North Carolina's Research Triangle Park has been "characterized by farsighted agressiveness" and "intellectual courage" on the part of governors, university presidents, and state legislators. Technological growth "will not be evenly

distributed among towns, cities and counties within states, much less among all the states," said Mr. Beilman, but the proximity of a university of technological excellence is a "critical factor" in attracting and retaining first-class personnel.

Following Mr. Beilman's remarks, Dr. Thomas E. Stelson, Vice President for Research, Georgia Institute of Technology, spoke about the Advanced Technology Development Center (ATDC) on the Tech campus in Atlanta. He described the ATDC as "a catalyst built around the research programs at Georgia Tech" with four primary goals: the incubation of new industry, recruitment of industries; support of industry in an operational sense--financial, legal, managerial; and venture capital development.

Senator Leonard C. Dunavant of Tennessee, SREB Treasurer, presided over the session on "Skills for the Work Place in an Era of High Technology: Myths, Realities, and Implications for Education." Dr. Henry M. Levin, Director, Institute for Research on Educational Finance and Governance at Stanford University, spoke about employment opportunities in high tech industries in the decade ahead. He emphasized that "high tech applications to a very large degree are reducing the skill requirements of existing jobs." And, he said, since "we cannot predict the precise skill needs over the lifetimes of workers" it is important to emphasize strong basic education for everyone. He concluded by saying that "society is not facing up to the larger fact that so-called recurrent education is going to become far more important in the future, and we're not prepared for it."

Following adjournment of the Board meeting, the Legislative Advisory Council met to discuss plans for the forthcoming August Legislative Work Conference.

1983 ANNUAL MEETING OF THE SOUTHERN REGIONAL EDUCATION BOARD

The Breakers
Palm Beach, Florida
June 9-11, 1983

Thursday, June 9

2:30 p.m. — Meeting of SREB Finance Committee
Senator Leonard C. Dunavant, Chairman

4:30 p.m. — Meeting of SREB Executive Committee
Governor William F. Winter, Chairman

6:30 p.m. — Reception and Dinner Meeting

Meeting the Need for Quality: Action in the South
Progress Report to the Southern Regional Education Board by its Task Force on Higher Education and the Schools

S. John Davis, State Superintendent of Public Instruction, Virginia; Chairman, SREB Task Force on Higher Education and the Schools

Friday, June 10

8:00 a.m. — Annual Business Meeting
(Breakfast served to Board members)
Presiding: Governor William F. Winter

President's Report: Winfred L. Godwin

Report and Recommendations of Executive Committee
Chancellor Vernon D. Crawford, State University System of Georgia; SREB Vice-Chairman

Election of Officers

9:30 a.m. — General Session

Chairman's Report: Governor William F. Winter

Programs to Improve Quality: New Incentives for Teachers

Roundtable: Governor Lamar Alexander and Tennessee legislators: Representative Steve Cobb, Senator James E. Elkins, Representative James M. Henry, Representative Dale Kelley

Billy R. Reagan, Superintendent, Houston, Texas, Independent School District

Jay M. Robinson, Superintendent, Charlotte-Mecklenburg, North Carolina, School System

Moderator: Winfred L. Godwin

Open Discussion

12:00 noon — Luncheon Meetings of Members of the Board and Legislative Advisory Council to discuss Report of Task Force on Higher Education and the Schools

Groups A, B, and C

2.00 p.m. — General Session
Presiding: Governor William F. Winter

Presentation of SREB Report: Higher Education and High Technology Economic Development

Charles W. Minshall, Battelle Institute, Columbus, Ohio

The State Role in High Technology Development

Governor Bob Graham, Florida
Governor Charles S. Robb, Virginia

Open Discussion

7:00 p.m. — Reception

Saturday, June 11

9:00 a.m. General Session

Institutional and State Responses to Challenges of High Technology

Presiding: Chancellor Vernon D. Crawford, SREB Vice-Chairman

D. S. Beilman, President, Microelectronics Center, Research Triangle Park, North Carolina

Thomas E. Stelson, Vice President for Research, Georgia Institute of Technology

Open Discussion

Skills for the Work Place in an Era of High Technology: Myths, Realities, and Implications for Education

Presiding: Senator Leonard C. Dunavant, SREB Treasurer

Henry M. Levin, Director, Institute for Research on Educational Finance and Governance, Stanford University

Open Discussion

12:30 p.m. Luncheon Meeting of SREB Legislative Advisory Council

ROSTER OF PERSONS ATTENDING
1983 ANNUAL MEETING OF THE SOUTHERN REGIONAL EDUCATION BOARD

ALEXANDER, Lamar, Governor of Tennessee, Nashville
BEARD, Sharon P., Deputy Commissioner, Louisiana Board of Regents, Baton Rouge
BEILMAN, D. S., President, Board of Directors, Microelectronics Center of North Carolina, Research Triangle Park
BELCHER, Mary, Education Daily, Arlington, Virginia
BIVENS, Steve D., State Representative, Cleveland, Tennessee
BOOZER, Howard R., Executive Director, South Carolina Commission on Higher Education, Columbia
BRAGG, John T., State Representative, Murfreesboro, Tennessee
BRANCH, Eugene T., Alston and Bird, Atlanta, Georgia
BRANDON, B. Douglas, Jr., State Senator, Little Rock, Arkansas
BREATHITT, Edward T., Jr., Cadiz, Kentucky
BROUN, Paul C., State Senator, Athens, Georgia
BROWDY, Jim, Palm Beach Teachers Association, Florida
BROWN, Wayne, Executive Director, Tennessee Higher Education Commission, Nashville
BROWN, William C., Director, Institute for Higher Educational Opportunity, SREB
CALLAN, Patrick M., Director, California Postsecondary Education Commission, Sacramento
CAPPS, Charles W., Jr., State Representative, Cleveland, Mississippi
CASTEEN, John T. III, Secretary of Education, Richmond, Virginia
CHAIN, B. L., Mayor of Hattiesburg, Mississippi
COBB, Steve, State Representative, Nashville, Tennessee
COHEN, Barbara, Florida Senate Education Committee staff, Tallahassee
COMBOS, Jeff, Office of the Governor, Nashville, Tennessee
CORNETT, Lynn M., Research Associate, SREB
CRAWFORD, Vernon D., Chancellor, State University System of Georgia, Atlanta
CROCKETT, Joe L., State Senator, Madison, Tennessee
CURRY, Shirley, Tennessee Chairman, Eagle Forum
DAVIS, S. John, Superintendent of Public Instruction, Department of Education, Richmond, Virginia
DELCO, Wilhelmina R., State Representative, Austin, Texas
DOLAND, Jack V., President, McNeese State University, Lake Charles, Louisiana
DORMAN, Arthur, State Senator, Beltsville, Maryland
DOZIER, Rush, General Counsel, Office of the Governor, Frankfort, Kentucky
DUNAVANT, Leonard C., State Senator, Millington, Tennessee
ECHOLS, Wayne, Special Assistant to the Executive Director, Commission on Higher Education, Montgomery, Alabama
ELKINS, James E., State Senator, Clinton, Tennessee
ERNST, Don, Education Liaison, Office of the Governor, Little Rock, Arkansas

FERGUSON, Jane, Secretary, State Services Office, SREB
FORD, Joe M., State Representative, Gadsden, Alabama
FOSTER, John C., State Senator, Cornelia, Georgia
FRAISER, John J., Jr., State Senator, Greenwood, Mississippi
FRANK, Pat, State Senator, Tampa, Florida
GALAMBOS, Eva C., Research Associate, SREB
GARY, Warlene, National Education Association, Washington, D. C.
GINSBERG, Leon H., Commissioner, Department of Welfare, Charleston, West Virginia
GODWIN, Winfred L., President, SREB
GOLDSMITH, Marta, Assistant Director, Southern Governors' Association, Washington, D. C.
GRAHAM, Bob, Governor of Florida, Tallahassee
GRAY, Frederick T., State Senator, Chester, Virginia
HASKELL, Preston H., Jacksonville, Florida
HENRY, James M., State Representative, Kingston, Tennessee
HOENES, Nellie, Office of Planning and Budget, Office of the Governor, Atlanta, Georgia
HUNT, Keel, Special Assistant to the Governor, Nashville, Tennessee
JOHNSON, Lowell, Fairmont, West Virginia
JORDAN, Robert B. III, State Senator, Mount Gilead, North Carolina
KAREM, David K., State Senator, Louisville, Kentucky
KELLEY, Dale, State Representative, Huntingdon, Tennessee
KEMBLE, C. Robert, President, Lamar University, Beaumont, Texas
KING, Alvin M., State Representative, Memphis, Tennessee
KNORR, Sheldon H., Commissioner, Maryland State Board for Higher Education, Annapolis
LAGER, Robert J., Mobile, Alabama
LEVIN, Henry M., Director, Institute for Research on Educational Finance and Governance, Stanford University, California
LONG, Jimmy D., State Representative, Natchitoches, Louisiana
LUCAS, Aubrey K., President, University of Southern Mississippi, Hattiesburg
MCCABE, Robert H., President, Miami-Dade Community College, Miami, Florida
MCDANIEL, Charles, Superintendent of Schools, Department of Education, Atlanta, Georgia
MCELRATH, Robert, Commissioner, Department of Education, Nashville, Tennessee
MCPHEETERS, Harold L., Director, Commission on Mental Health and Human Services, SREB
MINSHALL, Charles W., Research Leader, Community and Regional Development, Battelle-Columbus Laboratories, Columbus, Ohio
MULLINS, Andrew, Administrative Assistant to the Governor, Jackson, Mississippi
MUSICK, Mark D., State Services Officer, SREB
NEWELL, Barbara W., Chancellor, State University System of Florida, Tallahassee
NICKS, Roy S., Chancellor, State University and Community College System, State Board of Regents, Nashville, Tennessee

O'BRIEN, Anna Belle Clement, State Senator, Crossville, Tennessee
O'HARA, James, The Tennessean, Nashville
PAYNE, William H., Director, Federal and State Projects, Memphis City Schools, Tennessee
PESCI, Frank B., Sr., State Delegate, New Carrollton, Maryland
PICARD, Cecil J., State Senator, Maurice, Louisiana
PLUNKETT, Lamar R., Bowdon, Georgia
POLLAN, Carolyn, State Representative, Fort Smith, Arkansas
RAMSEY, Robert R., Jr., Chancellor, West Virginia Board of Regents, Charleston
RANDOLPH, Edward G., State Senator, Alexandria, Louisiana
REAGAN, Billy R., Superintendent, Houston Independent School District, Texas
REED, Charles B., Deputy Chief of Staff, Office of the Governor, Tallahassee, Florida
RICHARDS, Jody, State Representative, Bowling Green, Kentucky
RICHMOND, Mossie J., Jr., Vice-President for Student Affairs and Dean, University College, Arkansas State University, State University, Arkansas
RICHTER, Tom, Director, Council of State Governments, Atlanta, Georgia
ROBB, Charles S., Governor of Virginia, Richmond
ROBINSON, Jay M., Superintendent, Charlotte-Mecklenburg School System, Charlotte, North Carolina
ROSS, Ben Barron, State Representative, Lincolnton, Georgia
RUSS, Stanley, State Senator, Conway, Arkansas
SATTES, F. Lyle, State Delegate, Charleston, West Virginia
SCHIETINGER, E. F., Director of Research, SREB
SCHMIDT, William, President, Palm Beach Teachers Association, Florida
SINGLETARY, Otis A., President, University of Kentucky, Lexington
SMITH, David, Director, Palm Beach Classroom Teachers Association, Florida
SMITH, Loy M., State Representative, Strawberry Plains, Tennessee
SNYDER, Harry M., Jr., Executive Director, Kentucky Council on Higher Education, Frankfort
SOLOMON, Martha, Florida Education Association, Tallahassee
SPENCE, David S., Executive Director, Postsecondary Education Planning Commission, Tallahassee, Florida
STARNES, Paul M., State Representative, Chattanooga, Tennessee
STELSON, Thomas E., Vice President for Research, Georgia Institute of Technology, Atlanta
STEWART, Carl J., Jr., Gastonia, North Carolina
STUART, Reginald, Miami Bureau, The New York Times
SULLIVAN, Margaret, Information Officer, SREB
TALLMAN, Joyce, Secretary to the President, SREB
THOMPSON, Francis C., State Representative, Delhi, Louisiana
THOMPSON, Michael F., State Representative, Lafayette, Louisiana
TOLL, John S., President, University of Maryland, Adelphi
WHITE, Jesse L., Executive Director, Southern Growth Policies Board, Research Triangle Park, North Carolina

WHITSON, Zane C., Jr., State Representative, Unicoi, Tennessee
WILSON, Nick, State Senator, Pocahontas, Arkansas
WINTER, William F., Governor of Mississippi, Jackson
WOOD, Yvonne, Associate Director for State and Federal Affairs, Tennessee Higher Education Commission, Nashville
WORK, Walter M., State Representative, Burns, Tennessee
YANNI, Albert D., State Delegate, Glen Dale, West Virginia
YAWN, Larry, Education Coordinator, Office of the Governor, Austin, Texas

MINUTES

ANNUAL BUSINESS MEETING OF THE
SOUTHERN REGIONAL EDUCATION BOARD

The Breakers
Palm Beach, Florida
June 10, 1983

The annual business meeting of the Southern Regional Education Board began with an 8:00 a.m. breakfast for Board members on June 10 at The Breakers in Palm Beach, Florida. The business session, at which a quorum was present, convened at 8:35 a.m., with SREB Chairman, Governor William F. Winter of Mississippi, presiding. Governor Winter recognized Governor Lamar Alexander of Tennessee, Governor Bob Graham of Florida, and Governor Charles Robb of Virginia.

President's Report

Dr. Godwin's report as President of SREB appears on pages 20-24 of these proceedings. He recommended that the Board endorse the SREB Task Force on Higher Education and the Schools report, Meeting the Need for Quality: Action in the South, and commend it to the region as a platform for quality improvements in education, as it had endorsed the 1981 report, The Need for Quality. Dr. Godwin further recommended that the Board reaffirm its commitment to stronger ties between higher education and the schools for the purpose of improved quality by directing the SREB staff to pursue an implementation strategy for the recommendations in both Task Force reports, including their extensive dissemination and interpretation.

Governor Winter called for discussion on the President's report and its recommendations. Mr. Lamar R. Plunkett of Georgia moved that the Board approve the report of the President and the recommendations therein to endorse The Need for Quality: Action in the South and an implementation strategy by staff to pursue in carrying out actions on recommendations in both reports. There were numerous seconds, and the Board voted unanimously the endorsement of the Task Force report.

Report and Recommendations of the Executive Committee

Chancellor Vernon D. Crawford of Georgia, SREB Vice-Chairman, reported on the Executive Committee meeting held at 4:30 p.m. on June 9 at The Breakers and its actions concerning the proposed operating budget of $3,255,000 for 1983-84; study of a request for an increase in the regional contract fee for medical and dental students at Meharry; a report on changing conditions in health and human service fields and their impact on health professions education, as well as the most appropriate kind of advisory structure at SREB to help assure sound program direction consistent with interests of states and institutions; and an update on developments concerning a new headquarters facility for SREB in Atlanta, including a resolution of appreciation to Governor Joe Frank Harris of Georgia and to President Joseph Pettit of Georgia Institute of Technology.

Senator Paul C. Broun of Georgia moved adoption of the report, there were seconds by several others, and the Board voted to adopt the Executive Committee's

report and recommendations. (Minutes of the Executive Committee meeting appear on pages 25-30.)

Remarks by Governor Bob Graham

Governor Bob Graham of Florida briefly addressed the Board and commended it on its record of responding to real needs of the states in higher education and other education-related matters. He stated that the Board had always interpreted the "E" in "SREB" in a broad and flexible fashion and accordingly, has ignored artificial barriers in the field. Governor Graham discussed the current, great need for more effective attention to drug education. He said that he was pleased that SREB staff had been responsive to his request for ideas of possible new initiatives in this regard and that he looked forward to SREB pursuing new information strategies in drug education. He said such efforts would assist law enforcement agencies and their efforts to damage the supply side by decreasing the demand for drugs through new education programs.

Report of Nominating Committee

President Otis A. Singletary of Kentucky, Chairman of the Nominating Committee, presented the report of the Committee, which also included Senator Leonard C. Dunavant of Tennessee, Senator Robert B. Jordan III of North Carolina, and President John S. Toll of Maryland. The Committee's unanimous nominations for 1983-84 officers were:

Chairman	:	Governor Lamar Alexander, Tennessee
Vice-Chairman:		Chancellor Vernon D. Crawford, Georgia
Treasurer	:	Senator Arthur Dorman, Maryland

There being no other nominations, President Singletary moved adoption of the slate, there was a second by Dr. Roy S. Nicks of Tennessee, and the Board voted unanimously to adopt the report and election of the slate.

Governor Winter recognized and called on the new Chairman for remarks. Governor Alexander said that he looked forward to working with members of the Board. He said that the "hottest" states leading education reform are in the South and he knew that SREB's leadership had been a big part of it.

Other Business

Dr. John T. Casteen III of Virginia appealed to the Board to support the National Nuclear Science Advisory Committee's recommendation to the United States Secretary of Energy that the FY 1984 budget of the Department of Energy include funds to support construction of the National Electron Accelerator Laboratory under sponsorship of the Southeastern Universities Research Association (SURA).

There was shared concern by various Board members. President Singletary moved that a resolution of support be drafted, Senator Paul C. Broun of Georgia asked that a copy be sent to each Southern Senator and Congressman, in addition to Secretary of Energy Hodel; Senator Frederick T. Gray of Virginia then made a second, and the Board voted unanimously that a resolution be prepared

and sent to members of Congress in support of the SURA/NEAL proposal. (The resolution appears on the following page.)

There being no further business the meeting adjourned at 9:20 a.m.

RESOLUTION ADOPTED BY THE SOUTHERN REGIONAL EDUCATION BOARD
IN SUPPORT OF THE SOUTHEASTERN UNIVERSITIES RESEARCH ASSOCIATION/
NUCLEAR ELECTRON ACCELERATOR LABORATORY PROPOSAL

WHEREAS, the National Nuclear Science Advisory Committee has recommended to the United States Secretary of Energy that the FY 1984 budget of the Department of Energy include funds to support construction of the National Electron Accelerator Laboratory under sponsorship of the Southeastern Universities Research Association (SURA);

WHEREAS, the report of the Nuclear Science Advisory Committee speaks clearly to the scientific, technical, and economic advantages of the SURA proposal;

WHEREAS, the SURA universities and states have demonstrated their capacity to collaborate in a consortium unprecedented in American scientific endeavors and thereby to produce for the nation both advanced scientific competence and a broad base for technological progress;

AND WHEREAS, SREB takes a vital interest in scientific and educational progress in the South and in the nation;

THEREFORE, be it resolved, that the Southern Regional Education Board join the Nuclear Science Advisory Committee in recommending the Southeastern Universities Research Association proposal to Secretary Hodel and urge Secretary Hodel and all senators, congressmen, and governors of the SREB states to work toward assurance of funding for the SURA Nuclear Electron Accelerator Laboratory in the 1984 Department of Energy budget.

June 10, 1983

REPORT BY PRESIDENT GODWIN TO ANNUAL BUSINESS SESSION, JUNE 10

I appreciate the opportunity to report to you on what I believe has been another productive year of service by SREB to member states.

Any appraisal of the past year must recognize both the potential of the broad movement for increased quality in education as well as the reality of a continuing gap between region and nation on various measures of educational development. While actions aimed specifically at improving quality should, over time, translate into higher levels of educational and economic attainment, we must continue to address other matters that affect our progress toward national parity. For example, although the regional rate of participation in higher education has continued to grow, it remains significantly below the national rate. To cite another example, while we have greatly expanded doctoral level graduate work (we now award about a quarter of the national total of doctorates), a new review of national rankings of universities over the period from 1925 to 1982 reveals no real change in that 50+ year period in the region's relative status as a front rank center of graduate education. These examples suggest that policymakers should be concerned with a number of issues that determine the status of education in the region. As for SREB, they re-emphasize that one of the most important responsibilities set forth in its by-laws is to monitor and report on overall conditions and trends in higher education. Accordingly, SREB has always tried to be responsive to the data needs of its constituencies. I'm pleased to report that over the past year staff and a regional committee of state higher education agency representatives have worked to improve the regional data exchange, which has become increasingly important in the states. One result has been a refinement of institutional classifications which in turn improves interstate comparability of data by clarifying differences in state patterns of institutional mix.

A staff committee has been working on plans for upgrading our computerized capability to expedite data processing. Decisions will soon be made in this regard that should improve our data services.

An effective regional data collection and dissemination activity continues to depend on both timeliness and credibility, both of which are enhanced through the close cooperation of state higher education agencies and the research and state services staff of SREB. We continue to emphasize national comparisons, both to gain needed perspective and to help us sharpen our regional analyses.

Some of you have participated during the year in our examination of the way in which state budget flexibility relates to effective financing and management of public higher education. Case studies of four states, in and out of the

region, document recent shifts toward institutional flexibility, with trade-offs of greater post-audit activity and more systematic administrative procedures.

The case studies also offer preliminary indications that institutional flexibility can result in quality improvements, as opposed to mere cost cutting. These reports will be published and available shortly.

Education in the health professions has been a topic of major concern to SREB from the beginning of the regional compact. That concern has now come full circle--from an original need to provide arrangements for sharing scarce programs to the current problem of devising ways to scale down over-expansion.

The country has entered only the initial phase of what has long been expected--an inevitable, albeit it a slow and fumbling, attempt to control the runaway costs of a smorgasbord of health care services of unprecedented scale. This cost curtailment effort will have a significant effect on our university health centers and all health professions education. Medical education may be the core of the issue, but education and service programs in the whole array of health professions will be affected.

The SREB report on issues in health professions education, prepared by the staff and released on authorization of the Executive Committee, was an outgrowth of these concerns. We have been urged by various sources, including representatives of university health centers, to give increased attention to these issues and we propose to do so.

With some notable exceptions, state higher education agencies and legislatures have yet to engage themselves in confronting the very difficult choices posed in cutting back in the health field, all the more reason for the Board to be of all assistance possible in the objective consideration of the issues involved.

In that connection I would note that our attempt at expansion of health professions data in the regional data exchange tells us that cost information in these fields still needs considerably more illumination at the state level.

During the year SREB continued a variety of efforts to strengthen predominantly black colleges. These included technical assistance on staff development and administrative practices in student financial aid offices at nine institutions, funded in part by the Fund for Improvement of Postsecondary Education.

The Kenan Trust has authorized the inclusion of three additional black colleges in the instructional improvement program funded by the Trust and administered by SREB. This latest commitment brings the total of Kenan Trust funds to SREB for this program to almost $7 million.

Following a recommendation at our last annual meeting we sought assistance from various sources on steps to improve the pass rate of prospective black teachers on the National Teacher Examinations. Everybody deplored the problem but nobody offered to help. Accordingly, we moved ahead on our own and organized a consortium of nine interested black colleges (a) with an immediate objective of improving the test performance of their education majors, and (b) with a longer term aim of strengthening their general education curriculum with special emphasis on course content and syllabi. Subsequently, the Educational Testing Service has entered into an agreement with SREB to provide substantial in-kind assistance to make this project operational. The initial activity takes place this July, when faculty teams from participating colleges will attend intensive training sessions on test construction.

Assuring an adequate supply of black teachers has been addressed in the new report of the Task Force on Higher Education and the Schools, to which I want to turn for the rest of my remarks this morning.

As you heard last evening, and perhaps as you have seen in scanning its new report, the Task Force recognizes major progress in the region toward quality in terms of higher academic standards and graduation requirements in secondary schools, higher standards for college admission and tighter teacher selection standards. It recommends that priorities for further action be given to (a) improving the quality of teachers beyond minimum standards, (b) selecting school principals who can be educational leaders, (c) strengthening teaching of mathematics and science, and (d) making vocational education effective.

SREB's efforts over the past two years to follow up on the first report of the Task Force have been directed largely toward those areas in which the Task Force discerns major progress. These areas should continue to have our attention, since, as the Task Force observes, further progress in each is needed. In regard to teacher selection standards, for example, I have already mentioned one problem on which we are working, namely, assuring an adequate supply of minority teachers.

We have also begun a reappraisal of vocational education, the matter on which the Task Force says the least progress has been made. Our examination is focusing on (a) the purpose of secondary vocational programs, (b) duplication between secondary and postsecondary vocational education, and (c) the relevance of vocational education in each sector to changing economic needs.

Improvements in teacher education, together with incentives for superior teaching, merit SREB's attention. And indeed, as with the first report, staff expect to devote substantial attention to dissemination and interpretation of all the Task Force's recommendations.

At its 1981 annual meeting, this Board endorsed The Need for Quality, the first report of the SREB Task Force on Higher Education and the Schools. The report has had widespread influence, in part because SREB has devoted considerable effort to follow-up activities.

I recommend that the Board now endorse Meeting the Need for Quality: Action in the South, and commend it to the region as a platform, along with the first report of the Task Force, for quality improvements in education.

I recommend further that the Board reaffirm its commitment to stronger ties between higher education and the schools for the purpose of improved quality by directing the SREB staff to pursue an implementation strategy for the recommendations in both Task Force reports, including their extensive dissemination and interpretation.

The programmatic effect of these recommendations as far as SREB is concerned would be this five-part agenda:

1. The promotion and monitoring of standards for student achievement (i.e., high school graduation requirements and college admissions standards, as well as other requirements for progress across the academic spectrum). Additional attention will need to be directed to remedial education in response to the raising of performance standards.

2. The improvement of teaching, to include

   a. the monitoring of standards for selection of teacher candidates;

   b. the strengthening of teacher education programs, with special emphasis on revised content of teacher education curricula and on stimulating greater participation by institutional presidents in the evaluation and reform of teacher education programs;

   c. stronger incentives to enter and stay in teaching; and

   d. more effective continuing education for teachers.

3. The development of internships as a requirement in all educational administration programs that prepare principals.

4. Sharper delineation of issues in vocational education aimed at helping states assert responsibility for policy development in vocational education;

5. Promotion of further cooperation between higher education and the schools, with special emphasis on state-level bodies.

A program of these dimensions will keep this Board in a leading position in the broad effort to improve quality. The Task Force has done its job; ours is to expand upon the follow-through effort we began two years ago.

In closing, I would note that this is the 35th anniversary year of SREB. Recently I reviewed several periodic assessments of SREB that have been conducted by outside evaluators. I was struck in particular by one that was conducted by an experienced administrator of a major university and reported to the Board at its 20th annual meeting. It began with a comment that I found especially forceful: "SREB has always, in my experience, looked toward the future. But the look has been a realistic one, informed by the past." We could not receive a higher compliment, nor, I believe, could we have a more challenging standard to measure our work against now and in the years ahead.

MINUTES

SREB EXECUTIVE COMMITTEE MEETING

The Breakers
Palm Beach, Florida
June 9, 1983

The Executive Committee met at 4:30 p.m. on June 9, with Governor William F. Winter, Chairman, presiding.

Other members present were: Chancellor Vernon D. Crawford (Georgia); Senator Leonard C. Dunavant (Tennessee); Senator Robert B. Jordan III (North Carolina); President C. Robert Kemble (Texas); President Robert H. McCabe (Florida); Senator Cecil J. Picard (Louisiana); Representative Carolyn Pollan (Arkansas); Delegate F. Lyle Sattes (West Virginia); and Mr. Harry M. Snyder (Kentucky). Dr. Howard R. Boozer represented South Carolina in the absence of Senator Robert C. Lake, Jr.; Dr. John T. Casteen III represented Virginia in the absence of Governor Charles S. Robb; and Senator Arthur Dorman represented Maryland in the absence of Governor Harry Hughes and President Rhoda Dorsey.

SREB staff and others present: Winfred L. Godwin, William C. Brown, Harold L. McPheeters, Mark D. Musick, E. F. Schietinger, and Joyce Tallman. Others in attendance were Mr. Andrew Mullins, Office of the Governor of Mississippi; Mr. Eugene T. Branch, SREB attorney; Ms. Marta Goldsmith, Southern Governors' Association; and Mr. Tom Richter, Council of State Governments.

The agenda for the meeting and background papers on the items discussed were mailed to Board members prior to the meeting.

The Committee considered and acted on the following matters:

1. Update from the President

a. The Committee heard a report by President Godwin on matters discussed at the November 1982 meeting of the Executive Committee, including the SREB Task Force on Higher Education and the Schools. He reported that

considerable time had been spent in staff discussions on various recommendations that the Task Force made in the original report and the concluding report and that planning proceeds in regard to staffing the follow-through effort. He stated that his formal report to the Annual Business Meeting would recommend Board endorsement of the Task Force's concluding report.

b. Dr. Godwin informed the Committee of a resolution passed by the State Senate of Tennessee which requests that SREB increase the regional contract fees in medicine and dentistry at Meharry Medical College from $4,750 to $11,000. He stated that staff had kept Meharry officials informed about the feelings of participating states that contract fees generally are at appropriate levels. Following discussion by various Committee members, Mr. Harry M. Snyder, Jr. of Kentucky moved that the Executive Committee direct the staff to discuss this matter promptly with the contracting states with a view toward determining whether the states would be amenable to further increases in the near future, and, beyond that, a general indication of the states' attitudes toward future contractual relationships with Meharry. There was a second by Chancellor Vernon D. Crawford of Georgia, and the Executive Committee voted to direct staff to proceed along those lines.

c. Dr. Godwin also reported that he had been looking at SREB staffing in relation to continuing program obligations. He informed the Committee that he would probably be shifting some staff responsibility, eliminating one position, and looking primarily at maintaining strong capability in the research and state services areas.

2. Directions for SREB in Health and Human Services

Harold L. McPheeters of the staff reported that since the last Executive Committee meeting the Board had published a staff report entitled Health Professionals in the South: Supply and Cost Issues Needing State Attention, which had been authorized by the Committee (Attachment A, page 31). The report addresses a pending oversupply of health professionals in the South and the relationship between costs in health professionals education and in health care.

Staff recently convened a panel from state agencies and from university health centers to react to the report. The panel felt SREB had rendered a needed service by publishing the report and urged that SREB increase attention to the issues discussed in the report. Accordingly, staff expect to spend increasing effort in preparing and disseminating analyses and recommendations for policymakers and professional leaders. Dr. Godwin and Dr. McPheeters stressed the need to increase input from the total health field into the SREB effort and said that one possibility would be to revamp the existing SREB Commission on Mental Health and Human Services to include representatives from major health manpower planners, academic health centers and the professional schools that are central to the general manpower field.

President Robert H. McCabe of Florida asked that community colleges be included in the representation since they are a major provider of health care professionals.

The Executive Committee agreed that staff should give further consideration to the most appropriate kind of advisory structure at SREB to help assure sound program direction consistent with the interests of states and institutions in the health and human service areas. The Committee further agreed that this consideration include discussions with the SREB Commission on Mental Health and Human Services about possible modifications in the Commission to assure the most appropriate structure.

3. Governor Graham's Request for Interstate Initiatives in Drug Education

Dr. Godwin told Committee members that Governor Graham had requested to address the Executive Committee on the matter of drug education but would not be arriving in time and therefore would speak during the business session of the Board. Dr. Godwin informed the Committee that staff had sent some tentative ideas to Governor Graham but that if a special project were to be undertaken, it would have to have special funding.

4. Report on SREB Building

Chancellor Vernon D. Crawford of the Georgia Board of Regents brought the Committee up to date on developments concerning a replacement headquarters facility for SREB in Atlanta. He concluded that necessary elements in the resolution of this problem seemed to be falling into place and that with the support of Governor Joe Frank Harris the project appears to be on its way to completion, with SREB having access to the new facility in 1985.

Upon motion of Mr. Harry M. Snyder of Kentucky, with a second by President C. Robert Kemble of Texas, the Executive Committee voted to recommend that the Board adopt a resolution of appreciation to Governor Harris and to President Joseph Pettit of the Georgia Institute of Technology, as follows:

Now therefore, be it resolved that the Southern Regional Education Board express its appreciation to Governor Joe Frank Harris for the steps he has taken to provide SREB with a headquarters building to replace the former headquarters which was demolished for highway construction. Governor Harris' action makes it possible for SREB to continue its headquarters in Atlanta and thus to serve from that point its 14-state region.

Be it further resolved that this Board confirm the authority of its President to execute a repayment agreement with the State of Georgia similar to the one under which SREB reimbursed the State of Georgia for its previous headquarters. The Board looks forward to completion of its new headquarters facility as early as possible.

Be it further resolved, that the Board expresses its appreciation to Dr. Joseph Pettit, President of Georgia Tech, for his understanding and assistance in making the SREB replacement headquarters possible on the Georgia Tech campus.

5. 1983-84 Budget

The Committee received a report (Attachment B, page 33) by Senator Leonard C. Dunavant, Chairman of the Finance Subcommittee, which had met prior to the Executive Committee meeting. The report noted that the proposed operating budget is down some $245,000 from 1982-83 as a result of decreased federal support for special programs in health and human services but otherwise continues approximately the same level of program activity. Senator Dunavant moved adoption of the report, there was a second by Senator Arthur Dorman of Maryland, and the Committee voted to approve the Subcommittee report and operating budget of $3,255,000 for 1983-84, and to recommend its adoption by the Board.

There being no further business, Governor Winter adjourned the meeting at 5:50 p.m.

DIRECTION[illegible] SREB IN HEALTH AND HUMAN SERVICES

At its last meeting the Executive Committee of SREB discussed changing conditions in the health field and authorized publication of a staff report, Health Professionals for the South: Supply and Cost Issues Needing State Attention. The report addresses a pending oversupply of health professionals in the South and the relationship between costs in health professionals education and in health care. There have been further recent developments, such as the federal legislation to base Medicare payments for hospital care on fixed amounts for specific diagnosis related groups rather than on reimbursements for services, which will cause further turbulence for the health professions and for the professional schools.

All of this comes at a time when the federal government is cutting back on support for virtually all aspects of health manpower and leaving to the states responsibility for whatever action is needed to address current and emerging problems. It appears unlikely that federal funding will be available for special programs to assist the states in dealing with new manpower problems (oversupply, maldistribution, productivity, credentialing) which are common to all of the health and human service fields.

Staff recently convened a panel from state agencies and from university health centers to react to the report, Health Professionals for the South: Supply and Cost Issues Needing State Attention. The group felt that SREB had rendered a needed service by publishing the report and urged that we increase our attention to the issues discussed in the report. They expressed the view that SREB is in a better position to raise and pursue such issues as oversupply and related costs than are individual

special interests. The group felt that SREB's relationship with both educational and governmental communities could help foster a fuller understanding that new policies must supplant those that were operative in the period of great expansion.

Accordingly, we expect to spend increasing effort in preparing and disseminating analyses and recommendations for policymakers and professional leaders on such issues as how to affect the distribution of health professionals to rural areas and to subspecialties where they are needed, how to analyze the costs of health professions education, and how to improve the productivity of workers.

This effort will embrace all health fields, including mental health, which has been a special area of considerable program activity at SREB for many years. Largely through a wide variety of special projects funded by federal grants, that activity has been directed at manpower and research needs of both institutionally and community based services. With little special funding now available, there will be fewer such special projects at SREB, although we will continue program activity in mental health training and research.

In line with the program directions indicated above, we need to increase input from the total health field into the SREB effort. One possibility is to revamp the existing SREB Commission on Mental Health and Human Services to include representatives from major health manpower planners, academic health centers and the professional schools that are central to the general health manpower field.

It would be helpful to have guidance from the Executive Committee on an appropriate advisory structure at SREB that can help assure sound program direction consistent with the interests of states and institutions in health and human services.

ATTACHMENT B
EXECUTIVE COMMITTEE
June 9, 1983

FINANCE SUBCOMMITTEE REPORT

Action of the Finance Subcommittee, Southern Regional Education Board, The Breakers, Palm Beach, Florida, June 9, 1983

The Finance Subcommittee met at The Breakers on June 9, 1983 and considered an operating budget of $3,255,000 for 1983-84.

The Subcommittee voted to endorse approval of this budget and to recommend its approval by the Executive Committee and the Board.

Senator Leonard C. Dunavant
Chairman of the Finance Subcommittee

ATTACHMENT B
EXECUTIVE COMMITTEE
June 9, 1983

PROPOSED OPERATING BUDGET

SOUTHERN REGIONAL EDUCATION BOARD

1983-1984

Including summary statement (pages 35-36)

Budget tables (pages 37-43)

and notes on program objectives (pages 44-51)

SUMMARY

The proposed SREB operating budget for 1983-84 totals $3,255,000, down $245,700 from 1982-83 because of a decrease in federal support for special programs. Federal and private funds will comprise 27% of the new operating budget.

In addition to the operating budget, SREB will disburse $9.6 million on state funds to institutions under the regional student contract program, for a total fiscal operation of $12.9 million.

Page 37 provides a summary of expected income and proposed expenditures. The General Fund includes state support and income from publication sales and investment of temporarily idle funds. The Restricted Fund includes support through federal and foundation grants. Details of the summary are on pages 38-43.

Page 38 itemizes grants and contracts in hand for 1983-84. Additional projects might be funded by outside sources during the year, but the year will begin with five fewer such projects than in 1982-83.

Page 39 proposes operating expenses of $436,675, down slightly from last year as a result of the elimination of one staff position. Personnel costs include (a) 25% of salaries and fringe benefits of the president, information officer, editorial assistant, administrative assistant and two secretaries (the remainder of these is included in General Educational Development, below); (b) full salaries and benefits for the accountant, bookkeeper, administrative

associate, receptionist and two secretarial/clerical personnel.

Page 40 shows the General Educational Development budget with slight decreases in both the General and Restricted funds from last year. Included here are funds for the state services office, higher education information programs, and other activities of the president's office. Personnel include the remaining portion of certain positions mentioned above, plus the state services officer and one secretary.

Page 41 presents the budget for research and quality improvement activities with a proposed 9% increase in General Fund expenditures including a new staff position. Personnel include eight professionals and three secretarial/clerical positions.

Page 42 presents expenditures for educational opportunity programs, with substantial support from outside sources. General Fund support is included for two full-time staff.

Page 43 reflects the sharp drop in federally supported activities in the health and human services program. Personnel costs cover four professionals and three secretaries.

Salaries. Funds are budgeted for salary increases averaging 6%.

PROPOSED OPERATING BUDGET*
SOUTHERN REGIONAL EDUCATION BOARD
1983-84

	GRAND TOTAL	GENERAL FUND	RESTRICTED FUND
Income:			
State Appropriations	$ 1,120,000	$ 1,120,000	
Grants, Contracts and Other	835,131		$ 835,131
Miscellaneous	175,000	175,000	
On Hand	1,124,880	997,900	126,980
	$ 3,255,011	$ 2,292,900	$ 962,111
Expenditures:			
Personnel:			
Salaries	$ 850,115	$ 727,810	$ 122,305
Fringe Benefits	204,005	174,670	29,335
Travel and Conferences:			
Staff	91,740	64,000	27,740
Board and Advisory Groups	128,090	94,000	34,090
Office Operations	255,000	255,000	
Program Activities	1,141,124	412,500	728,624
Allocated for Future General Fund Operations	584,937	584,937	
Indirect Cost Reimbursement		-20,017**	20,017
	$ 3,255,011	$ 2,292,900	$ 962,111
1982-83 Comparative Totals	$ 3,500,709	$ 2,090,750	$ 1,409,959

*Not included in this operating budget are approximately $9.6 million in student contract funds to be received by SREB from states and distributed to institutions under the regional student program. Costs of administering this program are reflected in the operating budget's General Fund.

**Cash transfer from the Restricted Fund to the General Fund in payment of a portion of operating expenses included above.

RESTRICTED FUND BUDGET

Program	Income: Forward from 1982-83	Income: Grants, Contracts, and Other	Income: Total Restricted Fund 1983-84	Expenditures: Salaries	Expenditures: Fringe Benefits	Expenditures: Travel Staff	Expenditures: Travel Other	Expenditures: Indirect Cost	Expenditures: Program Activities	Source of Funds
GENERAL EDUCATIONAL DEVELOPMENT										
Uncommon Facilities	50,000	41,200	91,200				1,000		90,200	Participating SREB States
RESEARCH AND QUALITY IMPROVEMENT										
Liberal Arts Teachers	4,000		4,000						4,000	Nat'l Endowment for the Humanities
HIGHER EDUCATIONAL OPPORTUNITY										
Kenan Support Program		565,000	565,000	12,450	2,980	2,800	4,000	16,500	526,270	Wm. R. Kenan Jr. Trust
Improving Student Financial Aid		58,311	58,311	7,450	1,780	3,760	13,975	3,517	27,829	U.S. Department of Education
HEALTH AND HUMAN SERVICES										
Collegiate Nursing	72,980	49,330	122,310	54,285	13,025	6,400	6,600		42,000	Member Schools
Associate Degree in Nursing		121,290	121,290	48,120	11,550	14,780	8,515		38,325	Kellogg Foundation
TOTALS	126,980	835,131	962,111	122,305	29,335	27,740	34,090	20,017	728,624	

BUDGET
Operating Expenses
1983-84

	1982-83		Proposed 1983-84
Allotted	$ 478,175		$ 436,675*
Expenditures:			
Personnel:	$ 231,675		$ 181,675
Salaries		146,515	
Fringe Benefits		35,160	
Office Operations:	246,500		255,000
Stationery and Supplies		30,000	
Postage and Express		25,000	
Telephone and Telegraph		33,000	
Rent		75,000	
Rent of Equipment		2,000	
Maintenance of Building		5,000	
Maintenance of Equipment		16,000	
Legal Services		10,000	
Audit		9,500	
Depreciation - Furniture and Equipment		22,000	
Miscellaneous		27,500	
TOTAL	$ 478,175		$ 436,675

* $416,658 from the General Fund, $20,017 from the Restricted Fund.

BUDGET
General Educational Development
1983-84

	1982-83		Proposed 1983-84
Allotted	$ 541,150		$ 535,670
Expenditures:			
From the General Fund			
Personnel:	$ 197,600		$ 201,970
Salaries		162,880	
Fringe Benefits		39,090	
Travel:	102,000		108,000
Staff		28,000	
Board and Board Committees		80,000	
Program Activities:	149,350		134,500
State Services		30,000	
Legislative Work Conference		15,000	
Info. Programs on Higher Ed.		18,000	
Annual Report and Quarterly		24,500	
Academic Common Market		12,000	
New Program Development		35,000	
Total from General Fund	448,950		444,470
From the Restricted Fund			
Uncommon Facilities	92,200		91,200
Total	$ 541,150		$ 535,670

BUDGET
Research and Quality Improvement
1983-84

	1982-83	Proposed 1983-84	
Allotted	$ 489,985		$ 537,630
Expenditures:			
From the General Fund			
Personnel:	$ 271,985		$ 329,630
Salaries		265,830	
Fringe Benefits		63,800	
Travel	20,000		20,000
Library	3,000		4,000
Program Activities:	195,000		180,000
Comparative Educational Data		20,000	
School-College Link		95,000	
No-Growth Management		20,000	
Research Interpretation		25,000	
New Program Development		20,000	
Total from General Fund	489,985		533,630
From the Restricted Fund			
Liberal Arts Teachers			4,000
Total	$ 489,985		$ 537,630

BUDGET
Higher Educational Opportunity
1983-84

	1982-83		Proposed 1983-84
Allotted	$ 776,101		$ 715,081
Expenditures:			
From the General Fund			
Personnel:	$ 87,790		$ 56,085
Salaries		45,230	
Fringe Benefits		10,855	
Travel	13,000		8,000
Program Activities:	52,000		46,000
Teacher Education Consortium		10,000	
Developmental Education		7,500	
Financial Aid Staff Development		7,500	
Faculty Data Bank		1,000	
Compliance Planning		5,000	
New Program Development		15,000	
Total from General Fund	152,790		110,085
From the Restricted Fund			
Kenan Support Program		565,000	
Improving Student Financial Aid		55,616	
Total from Restricted Fund	623,311		620,616
Total	$ 776,101		$ 730,701

BUDGET
Health and Human Services
1983-84

	1982-83		Proposed 1983-84
Allotted	$ 901,083		$ 446,720
Expenditures:			
From the General Fund			
Personnel:	$ 139,635		$ 133,120
Salaries		107,355	
Fringe Benefits		25,765	
Travel:	22,000		22,000
Staff		8,000	
Advisory Groups		14,000	
Program Activities:	45,000		48,000
Monitoring Health Manpower Trends and Work with Acad. Health Ctrs.		20,000	
Developing Promotion/Prevention Proposals in Health		4,000	
Productivity Work with Mental Health Agencies		4,000	
New Program Development		20,000	
Total from General Fund	206,635		203,120
From the Restricted Fund			
Collegiate Nursing		122,310	
Associate Degree in Nursing		121,290	
Total from Restricted Fund	694,448		243,600
Total	$ 901,083		$ 446,720

State Services. These efforts are intended to link SREB's information, research, and consultation services with legislators, state government officials, and the staffs of both.

Providing concise data and information on a wide range of topics is a primary emphasis. This is done through the continuing research and information program and by responding to a growing number of requests for information on specific issues or problems. The ongoing reports alert state leaders to new developments and indicate that SREB can provide additional information. These include the Southern Higher Education Legislative Reports which highlight regional legislative developments and present end-of-session summaries; flyers and news memoranda which describe off-session legislative higher education developments; informal memoranda to Legislative Advisory Council members, selected legislators and staff bringing to their attention summaries and articles deemed to be of special importance; an annual compilation of "Higher Education Studies, Reports, and Surveys in the SREB States"; and special summaries of detailed, technical SREB reports.

Commissioned reports are sometimes used in subjects that require some special background, as in the case of this year's report on higher education and high technology economic development.

In addition to state government and educational leaders, the involvement of lay citizens in higher education is very important. SREB will continue to provide information to citizens serving on state education and higher education boards and seek to involve these persons in SREB programs and activities.

The SREB Legislative Advisory Council will sponsor its annual Legislative Work Conference in August in Asheville, North Carolina. Also, legislators will be included in meetings throughout the year on special issues or concerns in higher education.

Staff receive quite a large number of requests for information from state officials and their staffs. The prompt manner in which we try to provide reasonably comprehensive, practical information to state leaders--based generally on firsthand knowledge of developments and the persons involved in them--continues to be an unusual service provided by SREB.

Research and Quality Improvement. Major objectives are (1) to provide an organized flow of relevant statistical information covering higher education in the Southern region, (2) to conduct studies addressing critical issues in higher education, including quality improvement, and (3) to interpret pertinent information to educational decisionmakers in the region--largely through spinoff products based on the information and studies.

In regard to the statistical function special attention is being devoted to refinement and expansion of the regional data exchange (based upon recommendations of state higher education agency finance officers), and to computerization of elements in the data flow which can be improved upon and expedited by machine applications.

Briefly described below are a number of studies that are planned or are being considered, including those growing out of the work of the Task Force on Higher Education and the Schools.

Teacher Education. The preparation of the teaching force for the schools is a major responsibility of higher education, a task which in recent years has become

increasingly difficult because of declining student interest in the pursuit of teaching careers. This research effort will analyze teacher education programs of the region with a view toward improving their attractiveness to well-qualified candidates to the teaching corps.

Articulation. The need for articulation of secondary and postsecondary programs is suggested by widespread actions to upgrade high school graduation requirements and increase college admissions requirements. More attention is needed to duplication of curricula at the senior high school and the lower division college levels, with a view toward suggesting ways to eliminate slippage in academic progress at this pivotal point of transition.

Vocational and Technical Education. Work already begun on analysis of the vocational training commitments by communities, schools and colleges will be moving into a more complete inquiry of alternatives for establishment of updated priorities by states and systems seeking to improve the relevancy of vocational offerings at the respective levels. A current manpower supply and demand study at the less than baccalaureate level is also addressing part of this question--at the postsecondary level.

Curriculum Change. Management of higher education curriculum change, which in recent years has focused on the consequences of retrenchment curtailments, should be viewed in a more positive mode, namely, to assist in assuring adoption of appropriate additions to curricula and of revisions in emphasis on existing offerings in order to reflect the changing needs of the society and economy. Staff are considering the selection of one or more critical disciplinary areas for fairly intensive analysis, not only in manpower terms, but for examination of changing teaching methodologies and of relation to the total curriculum structure.

Funding of Education. A focus on retrenchment, which was triggered by impending demographic changes, has largely given way to consideration of how colleges and universities can cope with realities of economic stringency and pressures of competitiveness which override considerations of enrollment decline. Research program plans now focus more closely on questions of allocation in state revenue between education and other areas of state service, and on issues of how best to employ available resources within education.

Licensure and Accreditation. The roles of professional accreditation associations and statewide licensing agencies have been of increasing concern to educational policymakers. Staff from research and health programs are discussing a study of licensure laws for selected professions and their relationship to the professional accreditation function, institutional autonomy and access to the professions.

SREB's objective of communicating relevant information to appropriate SREB constituencies is one which bears continuous examination. In recent years there has been a growing preference for targeting particular interest groups by means of brief informational reports on selected educational subjects, largely prepared in collaboration with the SREB state services office, as opposed to comprehensive publications at less frequent intervals. Evaluation of the respective vehicles of communication--leaflets, flyers, booklets, technical reports, press releases, oral presentations, one-on-one consultation--needs to be made continually. Preliminary indications suggest that most of the communication vehicles now in use have some degree of effectiveness; selection of the medium suitable for the occasion is always needed.

Higher Educational Opportunity. A variety of SREB activities will be aimed at improving postsecondary opportunities for disadvantaged and minority students. One of these will address a major problem noted by the Task Force on Higher Education and the Schools, namely assuring an adequate supply of qualified black teachers. SREB will work with the Educational Testing Service and a group of predominantly black institutions to improve the performance of education majors on the National Teacher Examinations (NTE). Nine predominantly black colleges and universities have formed a consortium for the purpose of exposing their education majors to well-designed analytical and problem-solving experiences, through the general education curriculum, as a means of increasing the "pass rate" of their education graduates on the NTE. In addition to this immediate objective, a long-range goal is to aid the institutions in reviewing and improving the general education curriculum, with special emphasis on course content and syllabi.

SREB will also be providing technical assistance to over a dozen institutions, working in clusters, which are striving to increase persistence, retention, and graduation of underprepared students. This project is an outgrowth of two developmental education research and evaluation oriented seminars held in the fall of 1981. All of the participating institutions admit students lacking in the basic skills and are striving to meet their special instructional needs. The institutions are also concerned about increasing their student holding power. In addition, the public institutions are working to increase the enrollment of "other-race" students to meet desegregation compliance goals.

Through a grant from the Fund for the Improvement of Postsecondary Education and from SREB funds, assistance will also be provided to several institutions seeking to improve the administration of their student financial aid programs.

With funds provided by the William R. Kenan, Jr. Charitable Trust, we will continue to assist an assortment of predominantly black institutions to improve instruction in such fields of study as business administration, communications, mathematics, and science. The Kenan Trust provides $565,000 annually for support of this program, in which seven institutions participate each year, each on a five-year program plan.

SREB will continue to provide information and consultant services to higher education institutions and state agencies to assist them in the execution of compliance plans regarding the desegregation of public higher education. This will include keeping states informed of new developments which might affect them and analyzing and disseminating information to the appropriate institutional and state officials regarding matters of significant concern.

SREB also continues a Faculty Data Bank service to assist institutions desiring to increase the presence of "other-race" faculty and staff on their campuses.

Health and Human Services. Manpower training programs in these fields are in a state of considerable uncertainty because of cutbacks in both federal and state funds. Declines are likely in most fields and are probably desirable since the region is headed into oversupply in most fields (although there are still shortages in a few subspecialties, e.g., geriatrics and psychiatry and there are still problems in the distribution of manpower to some settings and geographic areas).

The academic health centers and the health professions schools appear to be headed for a period of further cutbacks as a result of recent hospital care cost containment measures. It is likely that the demand for certain kinds of personnel who are based in hospitals, such as allied health specialists, pharmacists, and

nurses will drop, but it is difficult to predict which specialties and how much until the regulations are written and the system begins operation.

At present virtually all of the remaining federal and national (foundation) funds in health are focused on research grants and contracts related to cost containment and improving productivity.

The human services generally have retrenched as a result of federal and state cuts so there are unemployed social workers, rehabilitation counselors, etc. In mental health there is renewed concern about productivity improvements and about community care of the chronically mentally ill. There is also interest in establishing closer relationships with training programs so that the graduates are better prepared to serve those most in need--the chronically mentally ill, the aged, children and adolescents and forensic patients. Virtually all federal funding for mental health manpower is gone.

In light of these trends and developments, SREB will expand its attention to monitoring changing health manpower needs with a view toward providing guidance to those responsible for manpower programs.

This will involve contacts with data sources such as state hospital associations and the AMA Master File of Physicians to obtain up-to-date information on such manpower data as hospital employment, service patterns and physician locations. This information will be compiled and analyzed for various professions. The information will then be compared with existing manpower and training enrollments.

Plans call for completion of studies in progress on dental education trends and costs in the region and strategies for affecting the distribution of health professionals to the need areas.

We will develop and seek funding for a project on ways to add training in prevention/promotion counseling skills to the education of physicians, dentists, and nurses. The present content of academic training programs regarding prevention/promotion is focused on the technical information of what persons should do to be healthy, but not on how to counsel patients to change their behaviors, an obviously more critical need in light of health care costs.

In addition, projects to improve education for geriatric nursing and other clinical specialties will be explored. This is an ongoing area of concern especially in the "retirement" states of the region which have high populations of older citizens. The Division of Nursing has declared this a high priority area for funding.

A number of mental health projects will terminate in the summer of 1983. A project proposal to research cutback strategies to protect programs for the chronically mentally ill is in review; if funded, it will be a one-year project.

MEETING THE NEED FOR QUALITY: ACTION IN THE SOUTH

Progress Report to the Southern Regional Education Board

by its

Task Force on Higher Education and the Schools

June, 1983

At its 1981 annual meeting, the Southern Regional Education Board endorsed the recommendations for educational reforms made in The Need for Quality, the first report of its Task Force on Higher Education and the Schools. The Board also extended the tenure of the Task Force for two years. The present report is our concluding assessment of regional response to the 1981 recommendations and an affirmation of priorities for further actions which we urge the educational and political leadership of the Southern states to pursue with all possible speed.

Our second report, Meeting the Need for Quality: Action in the South, documents real progress toward quality. It is an optimistic report, because the course for the future that it charts is offered in the knowledge that there are many public-spirited people in the Southern states who now recognize the critical need for restored momentum in educational progress at all levels--from kindergarten to graduate study. Concerted implementation of steps spelled out in our first report is reported across the region.

It should not escape the reader that "Major Progress"--the first part of this, our second, report--is a somewhat briefer section than "Priorities for Further Action." Barriers and special interests which impede major progress could be recited at length in explanation of failure to achieve more rapid realization of educational improvement; the only barrier which we would single out is the one most subject to correction by men and women of good will--namely, that of apathy and inertia.

We applaud the initiative of the Southern Regional Education Board in promoting strong ties between higher education and the schools, based on a common goal of quality. We believe that throughout the United States the determination to devote time, effort, and resources toward resolution of our educational woes is approaching an unparalleled level. We were heartened, as we concluded preparation of this report, by the call for excellence in the report of the National Commission on Excellence in Education, A Nation at Risk: The Imperative for Educational Reform. The national appeal to put education on the move again is a challenge that will support the region's efforts.

S. John Davis, Superintendent of Public Instruction, Virginia; Task Force Chairman, 1982-83

Martha Layne Collins, Lieutenant Governor, Kentucky
William H. Drummond, Professor, College of Education, University of Florida
H. Lynn Greer, Jr., Vice-Chairman, State Board of Education, Tennessee

Elizabeth G. Helm, Member, State Council of Higher Education, Virginia
J. B. Jones, Professor, School of Education, Texas Southern University
Milton Kimpson, Executive Assistant to the Governor for Education, Health and Human Services, South Carolina
William G. Monahan, Professor, College of Human Resources and Education, West Virginia University
Gwendolyn B. Mundy, Director of Elementary Curriculum, Hall County School System, Georgia
Saralyn B. Oberdorfer, Former member, State Board of Education, Georgia
John A. Peoples, Jr., President, Jackson State University, Mississippi
Cecil J. Picard, State Senator, Louisiana
Frank C. Robey, Jr., Staff Director, School Management Data Services, Baltimore City Public Schools, Maryland
Ray S. Smith, Jr., Former member, Arkansas House of Representatives, Hot Springs, Arkansas
Donald J. Stedman, Associate Vice President for Academic Affairs, University of North Carolina
Wayne Teague, State Superintendent of Education, Alabama

Kenneth H. MacKay, Jr., Ocala, Florida; Task Force Chairman, 1981-82 (resigned upon election to U. S. House of Representatives)

Two years have elapsed since the Southern Regional Education Board endorsed 25 recommendations of the Task Force on Higher Education and the Schools to move the South beyond minimum levels toward quality education.

The recommendations came at a time of widespread recognition that improvement in academic standards at all levels was imperative. Various Southern states have moved decisively on a number of those recommendations, even in the face of severe budgetary constraints. There has been progress toward quality, but much remains to be done.

The Southern governors and many legislators have played a major role in focusing on the improvement of education as the underlying prerequisite for economic development.

Region gaining momentum in educational reform

The region's momentum during the last two years in strengthening high school graduation requirements, raising college admissions standards, and mandating minimum requirements for teachers has propelled it to the forefront of what is proving to be a nationwide movement. A new spirit of cooperation, with joint action by boards of education and higher education, has characterized many of these moves. A commitment to higher academic standards has been demonstrated. The full realization of these objectives, however, demands persistence.

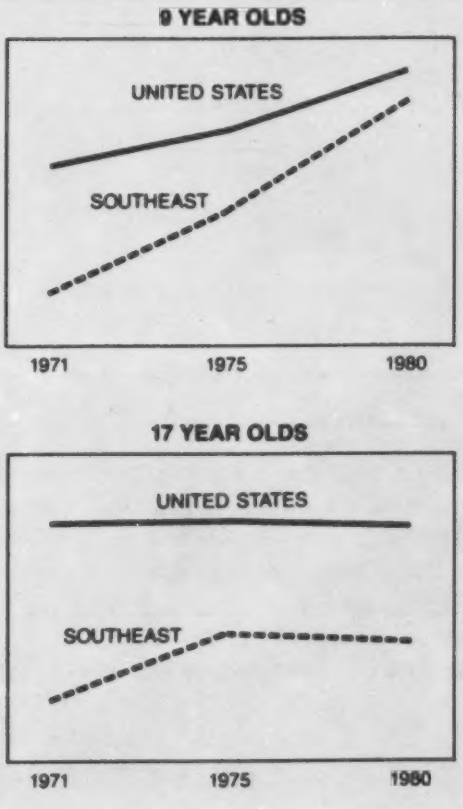
The initiative for educational improvements shown by state and local leaders across the region has been impressive. For example, several states have enacted programs to increase the number of well-prepared mathematics and science teachers, well before Congress began serious consideration of federal assistance on this problem. Reforms resulting from state, local, and institutional initiatives can bring about lasting, fundamental change; they do not have to be superimposed at the national level.

Yet, the task ahead is enormous

However, if education in the South is to match the region's ambitions for economic development, the task ahead is enormous. In many areas the South still lags in matters of educational achievement. Southerners are still less likely to attend schools, whatever the level, and their achievement scores on tests fall below national norms. The average high school dropout index for the region is 35 percent, well above the 28 percent nationally. While results over the past decade on the National Assessment of Educational Progress (NAEP) show improvement in reading for all age groups in the South, and in overall mathematics for nine and thirteen year-olds, all groups still lag behind the nation (see Figures 1 and 2). The slight narrowing of the gap between the

Figure 1

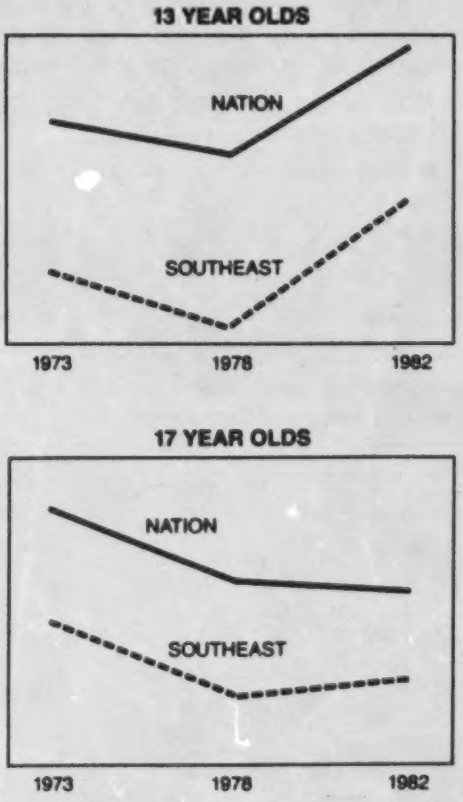
Reading Scores on National Assessment of Educational Progress United States and Southeast*, 1971 to 1980



*Scores for individual states not available; Southeast does not include Maryland and Texas.

Figure 2

Mathematics Scores on National Assessment of Educational Progress United States and Southeast*, 1973 to 1982



*Scores for individual states not available; Southeast does not include Maryland and Texas.

South and the nation is encouraging. But a lingering concern is that in each tested subject--reading, mathematics, and science--the ability of secondary students across the nation to answer questions involving higher order thinking skills has declined. These trends have extremely negative implications for a society that will depend on technological applications for economic growth.

With this report the SREB Task Force on Higher Education and the Schools concludes its assignment, encouraged in the knowledge that SREB will continue as

part of its ongoing program a major effort to improve quality through joint efforts by higher education and the schools.

This report discusses issues on which major progress has been made, and others judged to be priorities for further action, as indicated by the following report card on the South's road to quality.

Report Card: The Road to Quality

Major Progress

Raising High School Academic Standards and Graduation Requirements

Raising College Admissions Standards

Tightening Teacher Selection Standards

Cooperating Toward Mutual Objectives—Higher Education and the Schools

Priorities for Further Action

Improving the Quality of Teachers—Beyond Minimum Standards

- Rewards for Excellence
- Teacher Education Programs
- Teacher Certification
- Reciprocity Agreements
- Continuing Education of Teachers

Selecting Principals Who Are Leaders

Strengthening Mathematics and Science in the Schools

- The Curriculum
- The Teacher Shortage

Preparing Youth for Work

- Vocational Education in the High Schools
- Vocational Guidance

Reforms with lasting impact on educational quality usually involve the curriculum. The Need for Quality addressed this vital area by recommending concerted action by state boards of education and of higher education (1) to tighten the high school curriculum for all students, and (2) to raise college admissions standards, thereby sending a message to college-bound students to pursue a rigorous high school program. The actions on both fronts are quite encouraging, and demonstrate a commitment to raising academic standards generally.

Higher expectations lead to improved student achievement

Actions by schools and colleges to raise academic standards signal a growing awareness that higher expectations lead to improved student achievement. They also underscore a commitment to emphasis on instruction as the major priority. This in turn may lead to stronger demands for more rigorous academic schedules--a longer school day or year, fewer extended vacations and recesses for campuses.

Raising High School Academic Standards and Graduation Requirements

States have moved forthrightly during the past two years to raise high school graduation requirements. In 1980, the region's norm was 18 units required for graduation; today, most Southern states require at least 20 units. Half the states included only one year each of high school mathematics and science in 1980; today, two years of study in each of these subjects is the usual standard in the region. Some states have moved to require three years of mathematics. This does not mean that all students must take identical mathematics courses, but more will be required of each student, depending on the program pursued.

The increased number of units required for graduation is being accompanied by provisions that high school students spend a full day in school, ending the practice in many schools of seniors attending only a few hours per day. Specific definitions of what is recognized for credit in the major subjects have been incorporated into the required high school curriculum.

Higher academic standards for college-bound students

Some Southern states are moving toward different high school diploma requirements for students completing a college preparatory or honors program. For these students a higher number of units is required for graduation, including at least three years of mathematics and, in some cases, a foreign language. However, the strongest incentive for college-bound students to take a more rigorous high school curriculum comes not from a differentiated program enunciated by the school system, but from tighter college admissions standards.

The basic skills tests required for high school graduation, so widely instituted during the past few years, are generally acknowledged to be minimum competency examinations set at eighth and ninth grade levels. Passing rates often approach 100 percent, and correctly so; but that is not a significant measure of quality improvement. Rigorous academic standards, beyond minimums, that result from statewide requirements, and in some cases even more stringent local rules, are a welcome step toward quality education for all students in the secondary schools.

Current tests are truly minimal

The need for continued attention to academic standards by secondary schools is underscored by test results. The 1982 national average Scholastic Aptitude Test (SAT) scores, while up slightly over the previous year, were still eleven and seven percent below the verbal and mathematics scores of 1963, before the drop began. On the American College Test--which is widely used in seven Southern states--43 percent of the students in the South scored below 16 (out of a possible 36) in 1981; in several states, 15 is the minimum for admission into teacher education programs. Students who score at these low levels generally are considered to require remediation before they can pursue college-level courses.

College-bound students in the South have scored somewhat below the national average on scholastic achievement tests. Equally distressing is the fact that the region also is not nurturing the full potential of its high achievers. In 1982, 1.18 percent of the nation's high school seniors attained the status of National Merit Scholars; only one Southern state equaled this national percentage rate. For seven Southern states, the percentage is less than one-half the national rate.

The need to challenge bright students

Recent establishment of special full-time residential or summer high schools and programs demonstrates a growing commitment to challenge students to their intellectual capacities.

While the region as a whole is making strides, individual states are at different stages. In one state, recent emphasis has been on the establishment of statewide kindergartens--recognizing that early childhood education is the foundation underlying all else. In another state, the current emphasis is on development of the college preparatory curriculum, including foreign language study, to be offered in each school district.

The following recommendations are directed toward raising high school academic standards:

1. State and local boards of education should continue efforts to implement higher standards in the curriculum for all high school students.

2. States that have not already adopted more rigorous requirements for high school graduation should do so now.

Raising College Admissions Standards

The greatest improvement of academic standards results when both secondary schools and colleges raise their levels of expectation. The most convincing message to college-bound students for taking a rigorous

high school program comes when colleges forthrightly emphasize that certain requirements shall be met before students can be admitted. During the past two years, seven of the state higher education boards in the region have taken such action (see Table 1).

The general direction of these actions is to specify that students shall have completed four years of English, three years each of mathematics, science, and social studies, and in some cases, two years of foreign language studies. The new standards include specifications about the subject matter to be included in these units. For example, the prevalent requirement for mathematics is algebra I and II and geometry, with trigonometry recommended. Science courses must cover both biological and physical sciences and include laboratory components.

Statewide actions to strengthen college admissions standards

Of the seven statewide actions regarding high school preparation for college admission, standards in Florida, Kentucky, Maryland, and Mississippi are mandatory, although they are being phased in to allow sufficient time for curriculum changes to be implemented. In Louisiana (which is under a court decree of open admissions) and in Georgia, the standards are only recommended, rather than mandatory.

In South Carolina, final action rests with the individual institutions' Boards of Trustees. Likewise, in other states where higher education coordinating agencies have limited authority, responsibility for establishing higher admissions standards rests with leadership on the campuses.

Individual colleges are tightening admissions

Many institutions in the region have tightened admissions standards. The University of Tennessee raised its mathematics requirements to two years. The University of North Carolina at Chapel Hill now requires completion of a college preparatory curriculum that includes foreign languages. The University of Alabama has adopted a "core curriculum" for all students that will include two semesters of a foreign language or computer language. The University of Texas at Austin now requires a minimum SAT score of 1100 for applicants who are not in the upper 25 percent

Table 1
Units of High School Work Recommended or Required for College Admissions

	English	Mathematics	Science	Social Studies	Foreign Language	Other
Florida Board of Regents Required—Effective Immediately	3	2	2	2		A
Georgia Board of Regents Recommended—Effective Immediately	4	3	3	3	2	B
Kentucky Council on Higher Education Required—Effective Fall, 1987	4	3 (+1*)	2 (+1*)	2	*	C
Louisiana Board of Regents Recommended—Effective Immediately	4	3	3	3	3	D
Maryland Board of State Colleges and Universities Required—Effective Fall, 1989	3	3	2	4		E
Mississippi Board of Trustees State Institution of Higher Learning Required—Effective Fall, 1986	4	3	3	2½	2*	F
South Carolina Commission on Higher Education Recommended for implementation by individual public senior colleges by Fall, 1988	4	3	2	3	1*	G

* Extra units recommended

Notes: Some of these requirements will not be enforced until students currently in the ninth grade have graduated. Required courses are generally specified: for example, algebra II, chemistry, biology, United States history.

A. In Florida, the State University System requires three additional electives within the five major college preparatory areas. In 1986-87, the requirement will be four years of study in English, three years in mathematics, and three years in natural science, plus four additional electives in the college preparatory areas.

B. In Georgia, the following additional courses are also strongly recommended: trigonometry, an additional laboratory course in science, a third course in a foreign language or study in a second foreign language, fine arts (art, dance, drama, music), computer technology, physical and health education, and typing.

C. Kentucky's universities can exempt up to 20 percent of the freshman class from the requirements. Extra units are recommended in computer science and the arts.

D. Louisiana's Task Force report also recommends 2 units in physical education, 1 unit in the arts, and 4½ units in electives. The report specifies the recommended content for each course and suggests the competencies the students should demonstrate. A "Free Enterprise" course (½ unit) is also required. Also recommended are comprehensive semester examinations, using the Preliminary Scholastic Aptitude Test (PSAT) for diagnosing academic preparation, and that students take one unit of typing.

E. Maryland's state colleges and universities allow a small percentage of students to be admitted who are not prepared for college work, but no college credit is awarded for remedial work. The University of Maryland has also raised its requirements to 4 units of English, 3 units of mathematics, and 2 units of laboratory science.

F. Mississippi's Board of Trustees recommends that college-bound students take a computer science course and gain a level of typing proficiency.

G. South Carolina's proposed prerequisities include an additional unit of advanced mathematics or computer science or a combination of these; or one unit of world history or of international relations.

of their high school class. Such actions by "flagship" institutions to raise their standards could have a ripple effect elsewhere in their respective states. The danger exists, however, that declining or fluctuating enrollments will discourage some colleges; in some instances, changes in enrollment-driven funding formulas will be necessary inducements toward tighter admissions standards.

Generally, state and institutional actions to tighten admissions standards have centered on more rigorous high school preparation, rather than on higher SAT or ACT scores. In some systems (the University of Maryland, for example) SAT requirements have been raised but tied to high school grade-point averages--a high average offsetting a low SAT score. In many institutions a percentage exemption on admissions standards is allowed for students who may have the potential for college-level work but who need remedial help.

Florida has developed a college-level academic skills test which lower-division college students will have to pass before they may proceed to upper-division coursework. In Georgia, the Board of Regents' writing test has long been a requirement for graduation.

<u>This recommendation is addressed to strengthening college admissions requirements</u>:

3. While progress on raising college admissions standards is heartening, other states and institutions, including many in the private sector, will need to raise admissions standards to improve quality. States should direct close attention to serious barriers to improving admissions standards, such as inflexible enrollment-driven funding formulas.

Tightening Teacher Selection--Minimum Standards

Adherence to minimum standards for beginning teachers includes testing competency in the content of teaching assignments, as well as assessment of classroom performance.

Teacher tests plus performance evaluation

The Southern states were well on their way in 1981 to adoption of mandated certification tests (after completion of the college program) for beginning teachers. When The Need for Quality was issued, four states were already using the National Teacher Examinations (NTE) standard, three states had developed their own state tests, and the others were at various stages of deciding which test and what cut-off scores to adopt. Today, all but two states are using certification tests, and they too are considering such a requirement (see Table 2).

Table 2
Policies on Teacher Testing and Assessment in the SREB States

	Statewide Minimum Test Standards for Entrance into Teacher Education	Statewide Testing for Certification	Statewide Performance Assessment of Beginning Teachers
Alabama	yes	state tests	no
Arkansas	no	NTE	no
Florida	yes	state tests	yes
Georgia	no	state tests	yes
Kentucky	yes	to be selected (1983)	yes (1984)
Louisiana	yes	NTE	under study
Maryland	proposed	proposed	proposed
Mississippi	yes (Spring 1983)	NTE	no
North Carolina	yes	NTE	yes
South Carolina	yes	NTE or state test	yes
Tennessee	yes	NTE	no
Texas	yes (1984)	to be selected (1984)	no
Virginia	yes	NTE	yes (1986)
West Virginia	proposed	proposed	proposed

Two states have raised, or are in the process of raising, cut-off scores on their teacher certification tests, in recognition of the need to elevate minimum requirements if standards are to be meaningful.

Tests screen candidates for teacher education

It is preferable to test competency on basic skills of prospective teachers early, rather than after they have graduated. Presently 12 SREB states have instituted, or have proposed, minimum scores on a variety of aptitude or basic skills tests for admission into teacher education programs.

Three states in the region now have policies to terminate, or place on probation, teacher education programs that graduate large numbers of students who are unable to pass teacher certification tests.

Minority Representation

The implementation of certification tests to assure that teachers have achieved minimum competencies in their subject fields has been accompanied by substantially higher failure rates for blacks than for whites. This problem stems in part from the fact that fields other than education are attracting larger proportions of black students than previously.

Action needed to assure adequate supply of black teachers

As long as teacher turnover rates are relatively low, the current decline in the number of newly certified black teachers will not have marked effect on black representation in the teaching force. In the long run, however, such representation will suffer and will result in an unacceptably low number of black teachers. This calls for concerted action by states and by all institutions on their general education and teacher training programs. Predominantly black colleges have long been a major source of new black teachers. They are increasingly aware of the special challenge they face to upgrade student performance in their teacher education programs. In one response, selected predominantly black colleges have joined an SREB-coordinated project to strengthen the general education component of their curriculum. The project seeks to improve the ability of students to think analytically by assisting faculty in

construction and utilization of tests that will help develop analytical problem-solving skills.

This recommendation is concerned with improvement of the teacher selection process:

4. SREB should continue to foster and monitor changes in admissions standards for teacher education programs and results on teacher certification tests, with special concern for assuring an adequate supply of black teachers.

PRIORITIES FOR FURTHER ACTION

Improving the Quality of Teachers Beyond Minimum Standards

Minimum standards only a beginning

Minimum standards for teacher selection constitute only the beginning of a strategy to improve the quality of teachers. The mathematics section of a basic skills certification test in place in one Southern state is openly acknowledged to be at the eighth grade level. This means that teachers are tested for certification at scholastic levels below those of some of the students they teach. For many teaching fields the cut-off scores established by states in the region on the National Teacher Examinations do not exceed the bottom quarter of the national distribution of scores. For secondary science teachers in one state, the score needed to pass is exceeded by 95 percent of all who take the test nationally.

The most academically gifted young people have never been attracted into teaching in large enough numbers, but talented students, especially women, have traditionally entered education in numbers sufficient to staff the schools. In the Sixties, one out of six college freshmen indicated teaching as a career goal; now, only one in 20 makes this choice, and those who do tend to be among students who rank lower in test scores than

Getting outstanding teachers into classrooms

other majors. Policies that focus only on minimum competencies will not reverse this trend.

Rewards for Excellence

The issue of how better quality students are to be attracted into teacher education and retained in teaching careers is tied closely to salary levels. According to the National Education Association, the 1982 U. S. average salary for all teachers (including experienced ones) was $18,976. Thirteen of the Southern states fell below the national average, ranging from 26 percent below in Arkansas to eight percent below in Texas. Maryland is the only SREB state that exceeds the national average--by 10 percent. When beginning salaries offered to baccalaureates in business administration average $17,500, starting salaries at the $13,000 level are not going to attract many additional superior individuals into teaching, nor will the trend of a 50 percent decline in teacher education enrollment be reversed. Nor will salary schedules that offer no further raises after 15 years of service encourage the most able persons with other options to stay in teaching.

Salaries for teachers still lower than national average

The Southern states have made some progress, albeit slowly, in narrowing the gap between teacher salaries in the region and in the nation. For the last decade, average salaries in the region rose 106 percent as compared to 96 percent nationally.

Current initiatives on improvement of teacher salaries focus on rewards for excellent teachers. In Tennessee, the governor has proposed augmenting salaries for "master" teachers and administrators by as much as $7,000. The plan, to be studied by the legislature for a year, calls for four career steps for teachers, with "senior" and "master" teachers at the top of the ladder. Some 25 percent of all full-time certified teachers would be eligible for "senior" status; 15 percent would be eligible for the "master" level. The selection along the career ladder would not hinge on credentials but on performance, and teachers would have a large role in selecting the "senior" and "master" teachers.

Rewarding excellent teachers

The notion of rewarding excellence in teaching as an incentive to attract and retain the best is gaining attention in several states and school districts. The common threads that mark these moves are policies (1) involving teachers in the selection process, (2) utilizing the selected "master" teachers in training other teachers in the system, possibly through 12-month contracts, and (3) retaining superior teachers in classrooms.

These recommendations are offered on improving the quality of teachers:

5. Financial incentives should be established to reward outstanding teachers and to facilitate recruitment and retention of highly talented and motivated individuals. A renewed focus on excellent teaching will help to restore the honor of the profession--an important intangible reward that has eroded in recent years.

6. States should provide loan scholarships to attract academically superior college students into teaching, with special attention to the recruitment of minority students.

Improving Teacher Education Programs

Teacher education programs are besieged from many directions. Critics have questioned the rigor of what is offered in education courses. Attempts to improve the situation are frustrated by reduced funding as enrollments have declined and by tenure provisions. These conditions call for bold and courageous action--action that may best begin with deans of education. This includes thorough evaluation of the courses that are offered, using criteria of academic excellence, eliminating redundancy in material covered by successive courses, and applying or developing research findings on effective teaching and classroom management.

Presidents must provide leadership to improve teacher education

To the extent that colleges of education take forthright steps in these directions, institutions need to

respond more fully to the special needs of education programs. The prevalent university reward structure, which tends to neglect performance other than research, inhibits the colleges of education from greater involvement in and service to the schools. While research may deserve the highest priority status in the reward structure for a few excellent centers of educational research, this is not the case for most institutions.

The student teaching experience is a pivotal aspect of the professional education sequence. Field experiences leading up to student teaching should come early during the education major's program. The "clinical" approach, which applies theories of learning and teaching, needs to be injected throughout the pedagogy curriculum, rather than being limited to student teaching courses.

Strengthening general education to improve quality of teaching

Improving the general education component of teacher preparation is an integral part of the strategy to improve the quality of teachers. Failures on teacher certification tests demonstrate that weaknesses center in those areas addressed by the general education portion of a college program. While all college students should obtain a broad-based liberal education, including college-level language and mathematics courses, it is especially important that education majors obtain a solid foundation.

Community colleges provide the general education component for many prospective teachers. These institutions should be included in efforts to strengthen the fundamental competencies of education majors.

Lasting change requires college leadership

The Need for Quality stressed the importance of joint action by the state education and higher education agencies to review and improve teacher education programs. While clearly there is a need for state agency monitoring in this area, lasting and meaningful change will require leadership from within colleges and universities. The gravity and urgency of the matter require the leadership of college and university presidents, with involvement of both arts and science and teacher education faculties.

The following recommendations are made on improving teacher education programs:

7. College presidents should provide leadership, including the coordination of efforts by faculties in the arts and sciences and in education, to improve teacher education programs. Institutions, including community colleges, should closely examine the content of the general education courses education majors take, to assure a strong foundation for professional preparation.

8. College campuses should create incentives for closer involvement of faculty in the affairs of the schools.

Teacher Certification

Certification unduly rigid

Reform of the certification system entails removal of unduly rigid and unnecessary requirements, as well as inclusion of provisional certification for all beginning teachers until their performance has been evaluated. (Some states use the term "probationary" instead of "provisional" for teachers who have not been granted regular certificates.) The Need for Quality suggested that arts and science graduates be certified for secondary school positions on the same provisional basis.

In 1981, Georgia was alone in the region with a uniform statewide system to evaluate the on-the-job performance of beginning teachers, with provisional certification until demonstration of satisfactory performance. Similar systems have been instituted in three additional states and are under study or development in five other states.

Arts and science graduates as teachers

Little attention has been given to changing certification to accommodate arts and science graduates by issuing them provisional certificates on the same basis as education program graduates. While most states do employ such majors under an emergency certificate, which may entail lower pay, only Virginia has moved directly on this matter. In that state, arts and sciences

graduates may be provisionally employed in teaching jobs, just as education majors are, and then must complete nine hours of education courses or an alternate program to be approved by the State Department of Education. In Georgia, a special task force on teacher education has recommended to the State Board of Education a more flexible process for liberal arts majors to enter teaching. These majors would obtain a professional certificate upon admission to a specially designed master's program. A task force in Louisiana, composed of public school and higher education personnel, has proposed certifying mathematics and science majors to ease the shortage of teachers in those areas.

Too many certification fields

The complexity and rigidity of certification rules have not been addressed forthrightly by most states in the region. These rules generally include extended arrays of certificate fields that were created over the years and reflect, in part, the fragmentation of the high school curriculum during the Sixties. The current renewed focus on core subjects in secondary education may well give states the opportunity, and a compelling reason, to rationalize the variety of certificates they issue. For example, if English composition and literature are to constitute the basis of the required English credits during the four years of high school, the state's certificate fields should reflect that emphasis, rather than a proliferation of subfields, such as drama, speech, or journalism.

There may be a greater danger of assigning teachers out-of-field when many of them are highly specialized than when their teaching fields represent the major divisions of the high school curriculum. On the other hand, there are subjects that do require specialized preparation. An individual prepared for a general science teaching certificate is unlikely to have sufficient depth to teach physics. The desirability of broad-based certificates must be balanced against the need for specialists.

This recommendation is directed to the teacher certification process:

9. As a step toward simplifying the complexity of certification, states should reduce the variety of subjects for which they

issue certificates, based on a review of the curriculum in the schools, including the extent to which specialists in various subfields are assigned in-field and out-of-field.

Reciprocity on Teacher Certification Tests

Need for a common teacher certification test

The recommendation in The Need for Quality for a "common test" for teacher certification reflects concern over the cost of developing additional new state tests, as well as the impediments to interstate migration that result if teachers who have taken a test in one state are then required to take a different test when they move across state lines.

The only addition of state-developed tests in the past two years has occurred in a state where such tests are used for teaching fields that are not included in the National Teacher Examinations.

Reciprocity agreements that recognize other states' tests would facilitate the migration of teachers. Toward this objective, SREB has completed a study on the relationship between test scores on a state-developed test and on National Teacher Examinations. The results show that the same individuals are likely to be eliminated using either test. To date, no states have taken action to implement crosswalks between tests to facilitate the migration of teachers. Teacher certification reciprocity agreements, which some Southern states have signed, recognize teacher education programs approved by other states, but do not address the problem of certification tests differing across state lines. The Southern Governors' Association has endorsed the concept of interstate reciprocity for teacher certification tests.

This recommendation is made in support of a common teacher certification test:

10. States should move to a common teacher certification test. Those that use a different test should develop crosswalks with the common test to facilitate the interstate movement of teachers who have already taken the common test.

Continuing Education of Teachers

Progress has been more evident on assuring minimum standards for beginning teachers than on improving the quality of teachers already employed. It is easier to mandate minimum tests for the employment of new teachers than it is to improve the continuing education of teachers. Yet, the latter strategy is perhaps more crucial now because of relatively low turnover rates and, consequently, the small number of beginning teachers.

Need still urgent for effective continuing education

The recommendations outlined in The Need for Quality, though not generally implemented, still represent sound directions for improvement in the continuing education of teachers.

Staff development activities should be counted for the purpose of scheduled salary increases and recertification, provided (a) the activities reflect a local staff development plan that addresses specific objectives of the local school administration and reflects identified educational needs of the school district; (b) the local plan has been evaluated and approved at the state level; (c) the local plan has been formulated with substantial involvement of teachers.

The Conference of Southern Graduate Schools took an encouraging step at its 1983 session by endorsing a recommendation that the graduate courses teachers complete for recertification purposes should be relevant to the teachers' current assignment. Also, the Conference approved a recommendation that admissions

Admissions standards into graduate education programs

standards into graduate education programs should match an institution's standards for other advanced degrees. To the extent that teachers may not meet such standards, they would be admitted and earn recertification credits on a pass-fail basis, which, however, would not count toward a graduate degree. Such policies, if implemented by individual institutions, would sharpen the focus of graduate education in the improvement of teaching in the schools, and would add prestige to advanced degrees in education.

The following recommendations are offered to improve continuing education for teachers:

11. Institutions should insure that admissions requirements into graduate programs in education match their standards for other advanced degrees.

12. States should require that graduate courses taken by teachers for recertification are relevant to their teaching assignments.

Selecting Principals Who Are Leaders

Generally speaking, the success or failure of a public school depends more on the principal than any other single factor.

Selecting principals as educational leaders

In pursuing the Task Force recommendation that SREB consider ways of improving the preparation of principals, it became evident that improved selection of principals may be the most important element. Principals who are strong leaders establish a positive intellectual climate in their schools, and motivate teachers and students toward well-defined educational goals. School systems need to define the role of principals so that they might realistically function as instructional leaders.

Internship should be part of principals' training

Although it may be possible to train some individuals in certain components of leadership, more attention should be given in the selection process to the assessment of the behavioral attributes that characterize strong principals, beginning with admission to graduate schools. Some school districts have adopted a variety of means to discover potential leaders: (1) the services of the National Association of Secondary School Principals' Assessment Center Project, (2) the use of structured interviews conducted by carefully chosen selection committees, including lay members, and (3) the use of internship or assistant principalship trials to select the strongest candidates for principals' openings. A statewide effort to use the assessment center concept is being launched in South Carolina. Although all teacher education programs include a student teaching component, in many states the educational administration programs for training principals do not require an internship.

Many principals already on the job could improve their performance through in-service assistance. One-shot workshops on various managerial topics are unlikely to make a fundamental difference. Quality staff development for principals may entail on-the-job coaching. The identification in Florida of distinctive competencies associated with successful principals may be a promising direction for shaping effective staff development programs for principals.

<u>These recommendations are directed to selection of school principals</u>:

13. The assessment of behaviors which characterize effective principals should be used as a part of the selection process, beginning with candidates for graduate educational administration programs and extending to the selection of candidates for vice-principal and principal openings.

14. An on-the-job internship should become a requirement of all educational administration programs that train principals. Such an internship should provide true and prolonged exposure to the work patterns of a successful principal, and should be jointly designed and administered by schools and colleges.

The Curriculum

Science and mathematics education should develop individuals who understand how science and technology influence their personal and working lives. This will require greater emphasis on, and improved presentation of, science and mathematics in both elementary and secondary schools.

National testing reveals that students are improving their scores on those parts of examinations which cover rote memorization and drill, but at the expense of higher level reasoning and problem-solving skills. Students often take nine years of arithmetic emphasizing skills that can be easily accomplished with a hand-held calculator. Science, if taught at all in the elementary schools, usually lacks hands-on activity, and fails to stimulate the interest of children at that age. Yet, the prevailing message is that problem-solving abilities in both science and mathematics will become increasingly important to individuals.

Content of mathematics and science courses

Although most Southern states have increased the number of high school mathematics and science units required for graduation, so far there has been no widespread examination of the content of science and mathematics courses. While several states, including Louisiana and Texas, have carefully detailed the necessary content of courses for students in college preparatory programs, there has been no concerted effort to improve mathematics and science teaching techniques and materials in the earlier grades.

Planning needed for use of computers

The rush to computers in the schools in too many instances has not been preceded by deliberate planning on their uses nor how these might be achieved.

The educational function of computers in the schools is (1) to give all students some exposure to this rapidly evolving technology of the future, and (2) to assist teachers by means of computer-assisted instruction. The development and application of well-

designed software programs hold considerable promise for instructional uses.

The Shortage of Mathematics and Science Teachers

Efforts to transform the mathematics and science curriculum will not succeed unless there is an increased supply of well-prepared teachers.

The shortage of mathematics and science teachers has worsened since 1981, as the production of graduates prepared to teach mathematics and science continues to plunge. On the demand side, the growing recognition that elementary and secondary students must have more and better mathematics and science instruction adds to the disparity between the need for qualified teachers and the limited number that schools can attract and retain.

South leads in efforts to overcome shortages

Moreover, there is a growing realization that many teachers presently assigned to mathematics and science courses have not been sufficiently prepared in these areas.

The South has been in the lead nationally in actions states have taken to attract more science and mathematics teachers--without awaiting federal dollars. The broadest state loan-scholarship program in the nation for such teachers was enacted by Kentucky during 1982. Legislation authorizing a similar program was passed in Georgia, and is being considered in a number of other Southern states, with one state giving priority to prospective science and mathematics teachers in its existing scholarship program. Alabama also provides some assistance in the form of scholarships.

Improving employed teachers' mathematics and science competencies

A second approach consists of providing support to present teachers in other fields, or teaching out-of-field, to become certified in mathematics and science. A statewide program to this purpose is being provided in Florida through local teacher education centers, and in North Carolina through 20 eight-week summer institutes.

Such programs represent a partial remedy to the practice of assigning inadequately prepared teachers to mathematics and science courses.

A few universities have taken a leadership role to improve employed teachers' competencies in mathematics and science. Delta State University and several other Mississippi universities waive tuition for their programs. The University of North Carolina at Chapel Hill has obtained private support to cover tuition. School districts in Dallas and Houston are paying all costs for teachers to be retrained in these subjects.

The worsening shortage has led to differential pay for mathematics and science teachers, in response to market realities. Some school districts have acted on the fact that they compete with the private sector, which often pays twice the salaries offered by schools. Intangible rewards, which are said to motivate teachers, can be stretched only so far. A limited number of districts in the region are providing differential pay for shortage areas, and a program has been implemented in North Carolina to place one-third of its mathematics and science teachers on 11-month contracts, thereby increasing their pay by 20 percent.

Differential pay for shortage fields

There have been numerous appeals to industry to help solve the mathematics and science teacher shortage. The private sector, which is luring away the teachers, will be the primary loser if future manpower is not adequately trained in mathematics and science. Suggestions range from industry sharing its own staff with local schools to providing employment for teachers during the summer. For example, in West Point, Virginia, an arrangement has been worked out with a local corporation whereby the company provides a mathematics instructor for a half-day in exchange for use of school resources. In the main, however, schools cannot depend upon industry to staff science and mathematics courses on an ongoing basis.

Tighten general education for all teachers

The most immediate response by colleges and universities to improve mathematics and science instruction in the schools can be a tightened general education component for all teachers, especially elementary and middle school teachers. Presently, preparation programs

include very limited science and mathematics requirements for teachers, with as little as six hours required in each of these subjects. It would be hopeless to assume that science and mathematics curricula will be improved and adequately taught by teachers who have insufficient backgrounds.

Several recommendations are concerned with mathematics and science education:

15. As courses in mathematics and science are added to high school graduation requirements, states should carefully examine the content of such courses to insure that they serve the needs of college-bound and other high school students. States and local systems should also develop ways to revitalize the mathematics and science curriculum in the earlier grades.

16. State boards of education should develop guidelines for uses of computers in the schools and offer assistance in their implementation.

17. Because the shortage of mathematics and science teachers will not be met by any single strategy, states should enact a full array of incentives to attract, retain, and retrain teachers in these fields. States should closely monitor supply and demand and prevent placement of teachers in out-of-field assignments as a remedy for shortage situations.

18. All institutions that train teachers should examine their general education component and strengthen mathematics and science requirements for elementary and middle school teachers.

19. Colleges and private industry should share their personnel to assist schools with science and mathematics manpower shortages. State departments of education should modify their certification regulations to facilitate such placements.

Perhaps in no other area addressed in The Need for Quality has so little progress been made as in improving vocational education in secondary and postsecondary institutions. Three major issues need attention.

Confusion of purpose in vocational education

(1) What is the essential role of high schools in preparing youth for work? Is it through general career awareness programs that begin in early adolescence? Is it through the offering of "occupational clusters" that introduce students to broad vocational subjects, such as industrial tools or agricultural principles, or is it through training for specific occupations? Is the major responsibility of high schools in preparing youth for work to provide them with the basic skills of communication and mathematics that are needed in all occupational pursuits?

If each of these objectives is important, is it realistic to expect high schools to succeed in all areas, or is it desirable to establish priorities? To what extent can comprehensive high schools offer a varied occupational preparation program?

Enrollments in secondary vocational education are concentrated in the non-occupationally specific areas, such as home economics, consumer education, and industrial arts. Only a small proportion of the students enrolled in vocational education in the high schools participate in cooperative arrangements with on-the-job training. The image that vocational education has been a "dumping ground" for students who perform poorly in academic subjects reflects, to some degree, the reality of non-rigorous vocational programs. How can students be better served? By greater integration of basic skills instruction into vocational applications? By a focus on performance standards of identified occupational competencies? By redirecting the emphasis of vocational education in schools to technical programs and to on-the-job training?

Reducing unnecessary duplication

(2) How can unwarranted duplication of vocational offerings be reduced? What are the trade-offs between widespread access to postsecondary vocational programs

and the cost of duplication, especially for vocational programs that require expensive equipment and for which there is a scarcity of instructors? To what extent does duplication of offerings by different types of vocational institutions result from rigidities that assign certain age groups to one institution and other age groups to a different set of institutions? Is there the possibility of opening programs, regardless of their settings, to all who desire training and meet admissions standards?

(3) Do the vocational programs in secondary and in postsecondary institutions reflect the directions of economic change? Why do "technical" program enrollments constitute less than one percent of occupationally-specific vocational enrollments in the high schools, and only 13 percent in the postsecondary institutions? These enrollment patterns do not match economic development aspirations in a technological society.

Greater role for states in vocational education policy

Some states have addressed these issues seriously. The Texas legislature commissioned a comprehensive study of all vocational education programs in the state and is now considering the findings and recommendations. In Tennessee, a commission has examined the problem, concluding that the emphasis in the high schools should be to prepare students in the basic skills, and that the primary setting for occupationally-specific training is to be in postsecondary institutions. The Tennessee commission recommended consolidation of some postsecondary programs to eliminate unnecessary duplication, as well as greater emphasis upon technical programs.

Direct federal dollars account for 10 percent of vocational education expenditures. Some states have not addressed the objectives and the operation of their vocational programs in depth on the grounds that federal directives preempt state leeway in such decisions. Since the federal role is now up for reauthorization, states have an opportunity to seek more authority to shape their programs.

Industry could play a greater role in redirecting vocational education to reflect the work skills of the

future than has been accomplished through advisory councils in the past. Indeed, business leaders are currently involved intimately in the implementation of the Jobs Training Partnership Act (JTPA). That program is concerned with shaping the needed directions for retraining unemployed and displaced workers--directions which should be equally relevant in planning vocational education programs for young people. The time and effort top executives are devoting to point JTPA toward effective outcomes could be melded into state planning for vocational education.

Delivery of vocational guidance a major problem

Effective counseling of high school students to make reasoned plans for entering the labor market or for pursuit of further education continues to be a serious problem.

The employment of persons with labor market experience to counsel students may be an alternative to the use of academically-oriented counselors. Yet, school systems with grave financial problems are unlikely to employ enough specialists to provide adequate vocational guidance. The estimate of a current average ratio in the nation of 450 high school students per counselor illustrates the magnitude of the problem. For the time being, greater emphasis on career awareness and vocational planning will probably depend on individual teachers. Further efforts are needed in using occupationally-oriented counselors to help engage the entire school faculty in giving greater attention to career awareness throughout the academic and vocational curriculum.

This recommendation is addressed to vocational education:

20. If they have not already done so, states should give high priority to a close appraisal of vocational education. Such reviews should include evaluation of the objectives of vocational education in the high schools, of duplicated occupational offerings by the various sectors of education, and of the market relevancy and quality standards of available programs.

SREB should continue to delineate the issues and provide current and relevant information on ways to improve vocational education in secondary and postsecondary institutions.

Joint efforts of state boards encouraging

Each of the actions described in this report is heartening and represents initial and, sometimes, major steps on the path to quality education in the South. Perhaps the most notable trend of the past two years has been the new spirit of cooperation between schools and higher education. The recent initiatives to raise academic standards have, for the most part, involved coordinated action by state boards of education and of higher education. Lines of communication have been established through joint committees of respective state boards or through commissions composed of representatives of all the constituencies of education. These signal a cooperative style scarcely evident two years ago.

Higher standards for admission into teacher education programs exemplify joint policy development by the two boards in North Carolina, Virginia, and Georgia. Commissions, liaison committees, or task forces representing both sectors have worked in Texas, Maryland, Florida, Tennessee, Virginia, and West Virginia to produce a wide array of important recommendations, ranging from curriculum revision to improved staff development for teachers. Higher education agency efforts to revise minimum standards for college admissions have involved consultation with school personnel in Kentucky, Florida, Louisiana, and Mississippi.

School/college cooperation at the local level

Individual colleges and schools in some localities also are tackling problems together. These cooperative efforts cover a wide range, from the University of Virginia's instruction in the use of computers for classroom teachers, to advancement of liberal arts education in Appalachian schools by the University of Tennessee at Knoxville, to efforts of the University of North Carolina at Chapel Hill to train mathematics and science teachers for the schools. Colleges are assisting schools to serve talented high school youth, either on the college campuses or by promoting advanced placement programs in the schools.

Also heartening are efforts of local school-college consortia to inform young people within their area that a rigorous high school program is necessary to succeed in college. Leadership in this direction by Miami-Dade Community College, along with other colleges in that area, and the local public and private schools is noteworthy, as are the efforts by Lamar University (Texas) and nearby colleges and schools to develop joint strategies to raise educational standards in both sectors.

Colleges of education enjoy the greatest opportunity to contribute to and benefit from school-campus cooperation. They are already heavily involved in using the schools to train student teachers. While some colleges of education have initiated projects to improve teaching or management of schools, more widespread activity of this type would benefit both parties. The education faculty needs to stay current with the reality of schools' problems, while the schools may gain from exposure to research findings on the campuses.

Continued dialogue among educational leaders is essential

The Task Force on Higher Education and the Schools and the Southern Regional Education Board during the past two years have sought to expand dialogue between the various constituencies in education. There is great need for much more joint discussion on the issues covered in this report. This dialogue should include teachers and principals, superintendents and college presidents, accrediting agencies and professional organizations, as well as lay political leaders.

Opening the lines of communication is only the first step toward reform. The fundamental principle that education exists to serve students, first and foremost, is sometimes neglected in the competition to protect the interests of various constituencies. The interest of students, for example, comes ahead of competitive concerns by schools for average daily attendance slots and of colleges and various vocational education programs for enrollment credits.

While some recommendations in this report and in The Need for Quality may disturb one or another special interest in the huge educational enterprise, these recommendations reflect the philosophy that students come

first. The other concerns, while important, are secondary. With this spirit, communication involving the many constituencies of education will lead beyond minimum standards toward higher achievement by students in schools and colleges. That is the essence of the job to be accomplished.

Money and Quality Education

Meeting the need for quality despite financial constraints

The financial stringency of states in the region is even more severe today than two years ago when SREB published the recommendations on educational improvement in The Need for Quality. Realistic recommendations to raise educational standards must take into account limited resources. This implies the crucial necessity of making choices among numerous worthy expenditures.

Some of the recommendations in this report and of the previous report do entail additional financing. Substantial salary increases for good teachers will require sizable funding. Eventually the public will have to decide how highly it values quality instruction of the nation's youth.

It should not be overlooked, however, that many of the Task Force's recommendations not only entail no new costs, but could actually represent savings. Tightened college admissions standards may reduce the number of young people who spend a few quarters on campus, often in remedial work, before deciding they made the wrong choice. Indeed, expected enrollment declines in colleges and high schools suggest the possibility of savings if the "hard decisions" on closings and retrenchments are made through enlightened administrative and political leadership.

Use existing resources more effectively

The return to a more structured high school curriculum may cut the need for specialists in peripheral subjects. Reduced emphasis on the accumulation of college credits for renewal of credentials might slow the rush to graduate courses by teachers and, thereby, present an opportunity for more adequate funding of school district staff development, given adequate safeguards. Greater selectivity by graduate educational administration programs

would reduce enrollments and the vast supply of certified potential principals, many of whom will never be called on to serve in that capacity.

If current financial constraints lead to judicious reduction of programs and to deliberate choices between effective and less effective programs, all of education will benefit and the public may become more willing to provide further support.

TASK FORCE CHAIRMAN'S SUMMARY OF MEETING THE NEED FOR QUALITY: ACTION IN THE SOUTH

S. John Davis
State Superintendent of Public Instruction, Virginia

The Southern Regional Education Board's Task Force on Higher Education and the Schools made its first report to the Board during SREB's 1981 annual meeting. In the two-year period since then, our states have taken decisive actions on many of the 25 recommendations for improving the quality of education which were advanced in our first report, The Need for Quality. Tonight I am going to talk about some of that progress, which is summarized in the Task Force's second report, Meeting the Need for Quality: Action in the South. This new, and final, report of the Task Force also sets forth a set of priorities for future actions which we feel are essential to further needed improvements in the quality of education in the South.

However, before I get into that, I would like to make some comparisons which I find very interesting. As you know, there has been a great deal of publicity recently on what has happened to education in this country, prompted by the report of the National Commission on Excellence in Education, A Nation At Risk. That report, which, of course, was not released until April 1983, makes a number of recommendations and I was interested to see how many of the Commission's recommendations were similar to the ones made by our Task Force two years ago in The Need for Quality.

Recommendation A in A Nation At Risk, April 1983, reads:

> "We recommend that state and local high school graduation requirements be strengthened and that, at a minimum, all students seeking a diploma be required to lay the foundations by taking the following curriculum during their four years of high school...."

The Need for Quality, June 1981, made two recommendations on this topic:

> Recommendation 15: "The state boards of education and higher education in each state should establish a joint committee to consider concerted action to establish and raise standards for the high school curriculum as well as for the general education component of higher education."

Recommendation 16: "The state boards of education should examine the offerings of high schools for the purpose of strengthening the major field requirements, preventing the acceptance of peripheral courses to count for major subject requirements, and recommending repeal of legislatively mandated courses outside the major subjects."

Recommendation B of the National Commission's April 1983 report says:

"We recommend that schools, colleges, and universities adopt more rigorous and measurable standards, and higher expectations, for academic performance and student conduct, and that four-year colleges and universities raise their requirements for admission."

Recommendation 17 of the June 1981 SREB report reads:

"The higher education board in each state should seek simultaneous action by the colleges and universities to raise admission standards."

A Nation At Risk's Recommendation D5 states:

"Substantial nonschool personnel resources should be employed to help solve the immediate problem of the shortage of mathematics and science teachers...."

This problem was addressed in 1981 in The Need for Quality with two recommendations:

Recommendation 7: "States should develop an array of incentives to attract science and math teachers, including...."

Recommendation 8: "States should modify certification requirements to permit graduates in mathematics and science who lack professional education...."

On leadership, Recommendation E of A Nation At Risk says:

"Principals and superintendents must play a crucial leadership role in developing school and community support for the reforms we propose...."

Two years earlier, The Need for Quality had this to say on leadership:

"Generally speaking, the success or failure of a public school depends more on the principal than any other single person."

Now, here's the way the Task Force has assessed the progress Southern states have made over the past two years on these and other priorities for quality improvement. Various Southern states have moved decisively on a number of the recommendations, even in the face of severe budgetary constraints. Indeed, the initiative for educational improvements shown by state and local leaders across the region has been impressive. Major progress has been made on strengthening high school graduation requirements, raising college admissions standards, and mandating minimum requirements for teachers. A new spirit of cooperation, with joint action by boards of education and higher education, has characterized many of these moves. A commitment to higher academic standards has been demonstrated.

The full realization of our objectives for quality education at all levels, however, demands persistence, and if education in the South is to match the region's ambitions for economic development, the task ahead is enormous. In many areas, the South still lags behind the rest of the nation in matters of educational achievement. Southerners are still less likely to attend schools, whatever the level, and achievement scores on tests fall below national norms. For example, a look at the results over the past decade on the National Assessment of Educational Progress shows improvement in reading for all age groups in the South and, in overall mathematics, for nine- and thirteen-year-olds. Also, the gap between the South and the nation has narrowed somewhat.

Let's take a look at what Southern states have done to improve the selection, preparation, certification, and continuing education of teachers. The states have made major progress in the process for selecting future teachers. All but two of the SREB states now require applicants into teacher training programs to pass some type of objective tests at the end of their sophomore year of college. All but two states now require specified scores on a teacher certification test. For the most part, certification is being issued at the end of two years of teaching in the classroom, with evaluation of classroom performance of these beginning teachers made by internal or external (or both) evaluators.

I'm pleased to report also that retraining of existing teachers is underway in many of our states, especially in math and science. A number of states have developed programs to retrain teachers who are being reduced in force, or "riffed," from teaching positions and who need several hours for new certification in math and science.

There are some areas needing improvement that I would like to highlight for you. I've titled them "strategies to move beyond the minimum requirements." I'm still concerned about the teacher preparation programs. I'm concerned about the instruction teachers receive in content area, the area in which they will be teaching, the types of courses, and so forth. I encourage college

presidents in the South to become very actively involved in improving teacher preparation programs. I'm concerned about financial incentives to reward outstanding teachers. We've heard our governors and others speak to that issue, and we'll be hearing more on it tomorrow. Whether it is called master teacher or performance, merit, or incentive pay, we feel quite strongly that that's the direction that we should be moving. Another concern is accommodations for qualified arts and science majors who wish to teach, especially if we're going to share personnel with the private sector. There are those chemists and mathematicians and biologists who are not willing to take education courses and, thus, we need an avenue for those individuals to enter the classroom. So those four areas we feel need to be addressed.

We feel that not a whole lot has happened in staff development and the need for quality. We are still concerned that staff development at the local school level is very poorly planned and often is not relevant to that which the teacher may be teaching. We would encourage states to look into that more. And, of course, the standard for admissions into the graduate school programs of education are not sufficiently strong; that's something we feel needs attention.

The next area deals more directly with the high schools. A number of states and some local school districts have moved to increase high school graduation requirements for all students. In addition, states are considering honors diplomas to recognize outstanding students. One caution that I would suggest: simply requiring additional courses is in itself not sufficient. I'm very concerned that unless we identify the content of those courses, we will end up with "watered-down" kinds of programs. And, finally, the colleges must send a clear message of what they expect, and we're talking about college admissions standards.

A report card on what is happening in the states would show that strengthening graduation requirements for high schoolers is underway. (See table, p. 93.) In Florida a governor-appointed commission has made a recommendation; in some states, recommendations have been made by the state school superintendents, and in others, a state task force is now considering changes in the requirements. In Virginia, I have made the recommendation to the Board of Education that 3 units of science, 3 of math, and 2 of foreign language be required for the college preparatory student. Several years ago the recommended requirements for 22, 20, 18, 16 units of study for graduation would have been 14, 15, or 13 units. A number of states have made moves on tightening admissions requirements for college. What has been done really depends on the kind of authority that rests with the governing body for higher education. There are those states where the Council for Higher Education or the Board of Regents has a great deal of authority and can mandate, and in those states more has been accomplished. In other states, the Council of Higher Education is simply a coordinating body

HIGH SCHOOL GRADUATION REQUIREMENTS OR PROPOSALS FOR NEW REQUIREMENTS IN THE SREB STATES

	English	Social Studies	Mathematics	Science	Physical Education/ Health	Total Units
Alabama (Class of 1985)	4	3	2	1	3½	20
Arkansas	4	1			1	16
Florida (Class of 1985)	4	3	3	3	2	22*
(Class of 1987)						24
Georgia	4	3	2	2	1	21*
(To be voted on by State Board of Education in November--Effective Class of 1988)						
Kentucky (Class of 1987)	4	2	3	2	1	20
(Freshmen and sophomores must take English, math, and science courses)						
Louisiana	4	2	3	2	2	22
Maryland	4	3	2	2	1	20
(A state Task Force is considering revisions)						
Mississippi	3	2½	1	1		16
North Carolina	4	2	2	2	1	20*
South Carolina+ (Class of 1987)	4	3	3	2	1	20
Tennessee (Class of 1987)	4	1½	2	2	1½	20
Texas	3	2½	2	2	2	18
(Task Force is considering changes, possibly three years of math)						
Virginia+ (Class of 1988)	4	3	2 +1 of either	2	2	20*
West Virginia	4	3	2	1	2	20

+South Carolina and Virginia vocational students may substitute occupational program sequences for some math and science requirements.

*Florida, Virginia and North Carolina have honors diplomas which include additional mathematics and science requirements as well as foreign language. Georgia has proposed an endorsed diploma which would require additional mathematics and science as well as foreign language.

and the decisions are made by each individual institution. That is the case in Virginia and the individual institutions of higher education will have to do something about the admissions requirements; the governing body at the state level does not have that authority.

The next area has to do with preparing youth for work. This was another chapter of the initial report, and I'm disappointed to report to you that very little progress has been noted in this area. The first recommendation in The Need for Quality says: "The mission of vocational education in high school must be defined." I think this is critical. I think we must ask the question: Should high schools be preparing the students' hands for specific skills or should high schools be preparing the students' minds for broader training and retraining? Once we've answered that question and identified the mission of vocational education we can go forward. In my opinion this is one of the critical questions that has to be asked, and answered, in vocational education. The Task Force is suggesting that reviews must be conducted to insure that duplication of efforts between secondary and postsecondary schools does not exist. Another question to be answered is: Does vocational education address the technical needs of today's world? I'm concerned that we may be training for obsolescence; we have to be assured that this isn't happening.

And, finally, our recommendations deal with the cooperation between elementary, secondary, and higher education that is required if education and educational programs are going to be successful. In some parts of the region some noteworthy things are indeed happening. At the local level for example, President McCabe, who is president of Miami-Dade Community College in Florida, brought together the local superintendents and the college administrators to assist in raising the requirements for high school graduation and college entrance. In Virginia, the Council of Higher Education and the State Board of Education meet in joint sessions twice a year, and liaison committees of the two boards meet many more times during the year. This kind of cooperation is going on in several states where the two boards are discussing such problems as approval of teacher programs, preparation programs, improving guidance counseling, and upgrading teacher preparation programs.

All in all, I'm encouraged by what has happened since The Need for Quality was issued. But I'm not satisfied. We still have a long ways to go. I believe quite strongly that SREB has set in motion an effort that has had a remarkable impact, and has succeeded, possibly beyond the expectations, in helping to improve public and higher education in the South. The SREB staff has provided the proper amount of encouragement, leadership, and, oftentimes, prodding to keep the Task Force on target, forcing us to be specific in our recommendations, forcing us to address the hot issues such as teacher certification and graduation requirements, to disturb special interests when necessary. My compliments to them; they've done a fine job. It has been a distinct

honor to serve on this SREB Task Force which has probably been one of the most challenging and exciting experiences of my career.

I suggest to you that with the support of SREB and our governors and members of the legislative groups, education in the South will change and it will improve. Your leadership has made it start to happen. I know that I speak for the entire Task Force in urging this Board to do all that it can to keep the process alive and well.

REMARKS BY GOVERNOR WILLIAM F. WINTER, SREB CHAIRMAN
ON JUNE 10 AT 1983 ANNUAL MEETING OF SREB

Welcome to the second General Session of SREB's annual meeting. I believe you will agree that this 1983 meeting was launched in fine fashion last evening by the excellent report of Dr. Davis on behalf of the Task Force on Higher Education and the Schools.

I want to take this opportunity to congratulate the Board again for its wisdom two-and-a-half years ago in establishing the Task Force and creating an extremely productive force for better education. This organization should indeed be pleased with the impetus and backing that The Need for Quality has given many of us who have felt that improving the quality of education was the number one priority for continued social and economic progress in our region.

I want particularly to note Governor Bob Graham's foresight in his role as Chairman of the Board when he appointed the Task Force. The work of this group, and the down-to-earth proposals it has provided the region, should be highly commended.

We should be gratified that the program for progress first recommended by the Task Force two years ago has been echoed in recent reports from the National Commission on Excellence and other national groups that have joined the appeal to reform education. But the truly significant fact for us to bear in mind, and to take added heart from, is that the initiatives now recommended nationally on tighter selection of teachers, on toughening the high school curriculum, and on raising college admissions standards are well on the way to implementation in the South. These actions are well on the way because we have been working hard for the past two years, supported and encouraged by the SREB quality improvement efforts.

Yes, we can be proud that our states recognized that quality improvement had to be a priority well before it reached its current place on the national agenda. But this is foolish pride unless we keep on working--unless we acknowledge that in many respects our educational system still lags. I am confident that we will stay on the move to close those gaps, for I sense a greater determination than ever before to deal forthrightly with our problems.

SREB must continue to play a special role in helping us assess progress and shortcomings, and in encouraging us to continue to take needed actions. In addition to what it has been doing, SREB could also help by bringing to us an annual assessment of the state of educational progress in the South. I can see this being placed before governors at their annual meetings, before

legislators at the SREB Legislative Work Conference and other legislative meetings, before education leaders at appropriate forums, and, of course, before this Board. I am therefore proposing to our new chairman (and to Dr. Godwin) that we develop such an annual assessment to help keep our focus on improving quality in our colleges and schools.

I trust that this assessment will take into account another special aspect that has marked our quality improvement efforts in the region. I remind you that the Task Force was labeled "Higher Education and the Schools." We have clearly emphasized the tremendous interdependence of the two sectors. We realize that it is impossible to move toward quality if we fail to mobilize colleges, universities, and the public schools. Over and over again, our Task Force has reminded us that joint actions are needed on many fronts. A more rigorous high school curriculum depends to some extent on the messages colleges send to the high schools. On the other hand, colleges will have a difficult time getting out of remedial education if the schools fail to raise their expectations and demands of students.

As you study the Task Force's second report, Meeting the Need for Quality: Action in the South, you will note that one of the largest parts of the collegiate enterprise is still in need of substantial improvement. That part is the in-service education of teachers, both in graduate schools and in school-based staff development programs. Here again, progress will hinge on coordinated efforts by schools and colleges. With appropriate apologies, Governor Graham, to Orlando and Disneyworld, teachers perceive many of these continuing education activities as "Micky Mouse" ones. The present system for recertification and upward movement on the teacher pay schedule is predicated on completion of advanced coursework. Our state departments of education and higher education agencies have a mutual responsibility to insure that graduate work will truly represent advanced work, and that it is relevant to teachers' assignments, if they are to gain recertification credits and bonuses for such coursework.

Vocational education is another area where improvement hinges on joint efforts of schools and colleges. Our states have equipment and resources in both sectors of education that could be used more effectively if we could eliminate unwarranted duplication. We badly need to improve the coordination of the vocational program offered in high schools and area centers with the postsecondary occupational programs in vocational-technical institutes and community colleges. For example, we cannot afford the luxury of allowing expensive equipment to stand idle--unused at certain times of the day--just because we have erected arbitrary barriers that divide secondary and postsecondary institutions.

We are keenly aware of the need to redirect vocational education from out-dated programs that do not lead to jobs toward technical preparation for expanding occupational opportunities. Our postsecondary occupational programs have a better record on reacting to changing market demands than is true of many high school vocational programs. I am pleased that the Task Force suggests SREB should assist states as they examine their vocational offerings.

A stronger spirit of cooperation between state boards of education and higher education in various states can be traced to the work of the Task Force and SREB. In these instances we have seen boards jointly considering issues such as tighter admissions standards into teacher education programs and revised college admissions standards. But we should not lull ourselves into a false sense of security that this emerging cooperation will survive without continuous nurturing. I would hope therefore that SREB will continue to promote joint consideration and action on common problems affecting higher education and the schools. Furthermore, there is a crying need to engineer the cooperative approach locally--between individual colleges and local school districts. I note with pleasure the leadership toward this objective that has been given by one of our college presidents on this Board, in Miami-Dade County. Perhaps SREB could promote similar initiatives by college presidents to reach out to school superintendents, so that together they might tackle local issues on educational quality, and fuller utilization of their individual resources.

We would all be remiss in approaching the objective of greater quality in higher education and the schools if we ignore the financial issues. I am pleased to see the comments in Meeting the Need for Quality: Action in the South regarding financial constraints. This Task Force was obviously composed of idealists who have their feet firmly on the ground. The Task Force reminds us that in some ways quality will require more money. If the public really demands better teachers, it will finally have to face up to paying good teachers salaries that are competitive with what they could earn in other occupations. But the Task Force also reminds us that many of its recommendations might entail savings. I particularly urge you to read the last section of the report that points to several areas where less might mean better. It is refreshing to see this kind of note in a report prepared with input by educators.

Our program this morning deals directly with the issue of new incentives for attracting and retaining good teachers. We are all too familiar with the disturbing data about the low SAT or ACT scores of college students who choose education as a major, and about the decline of even those low scores in the last decade, as increasingly, our bright students choose other professions. A North Carolina report documented that teachers with higher National Teacher Examinations scores leave the profession before those who score lower.

We are all painfully aware of the loss of mathematics and science teachers to jobs in the private sector that pay twice as much as teaching. These are grave problems, and they comprise the basis for the panel discussion that is next on our program: New Incentives for Teachers.

Before turning the program over to President Godwin, who will introduce and moderate the panel, I wish to thank Dr. Davis and the Task Force for their signal contribution to the region. I hope that those of us who represent our states on the Southern Regional Education Board and on its Legislative Advisory Council will do everything possible to extend the Task Force's message across our states.

ROUNDTABLE DISCUSSION ON PROGRAMS TO IMPROVE QUALITY: NEW INCENTIVES FOR TEACHERS

Governor Lamar Alexander and
Tennessee legislators:
Representative Steve Cobb, Nashville
Senator James E. Elkins, Clinton
Representative James M. Henry, Kingston
Representative Dale Kelley, Huntingdon

Billy R. Reagan, Superintendent, Houston, Texas, Independent School District
Jay M. Robinson, Superintendent, Charlotte-Mecklenburg, North Carolina, School System

Moderator: Winfred L. Godwin, SREB President

Dr. Godwin. Incentive pay, or so-called merit pay, is not, of course, a new idea; it has been kicked around for 50 or 60 years. In most instances, it has been tried in very limited fashion and, frequently, with very poor planning. The really new thing, and I think the really significant thing, is the comprehensive nature of the new proposals. These talk not just about money but about staff development, and the layout of career ladders and opportunities for professional people to grow and develop as professional people at the same time that they're being rewarded for improvements in their performance.

Today we are going to discuss this very exciting topic. We have a rather sizable panel of very distinguished people, so I'm not going to take any more time from their presentations with discussions of background information. We're going to start by looking at the most comprehensive proposal that has been made--the so-called "Master Teacher" plan offered by Governor Alexander of Tennessee. I have heard this plan variously described. Some people have called it the boldest plan that has come down; others say it is the brashest plan. One out-of-state newspaper said, "It remains to be seen whether Alexander is Alexander the Great, but it's already clear that he's Alexander the Bold."

Governor Alexander is in the first year of a second term. In his first term a bipartisan comprehensive task force on education was appointed to review the entire education program in Tennessee. Basing his program and recommendations on the conclusions of that task force, Governor Alexander presented an ambitious 10-point program for better schools in Tennessee. The centerpiece is the Master Teacher plan.

Governor, to get this started, I wish you and your colleagues would tell us why you think this concept of incentive pay is so critical, and describe the principal elements in the Tennessee Master Teacher plan.

Governor Alexander. I usually begin these discussions in which I have a chance to appear--and they're coming more and more often lately--with this statement,

which no one has been able to contradict yet: No state public school system pays one teacher one penny more for doing a good job of teaching. Now that's a very important thing to notice, so let me say it again: Not one state public school system pays one public school teacher one penny more for doing a good job at what they were hired to do. Teachers can make a little more by going into administration, by staying around, by going back to school, but they can't make a penny more for demonstrating they're good at doing what they were hired to do.

At a time when our focus is on excellence, we reward mediocrity. Our pay scale features low wages, lifetime contracts, little real evaluation, and not one penny of pay for performance. When you state it like that, it seems to me to be probably the most indefensible form of public policy in the country today, and anyone who has never been involved in education could well ask, "How in the world did a thing like that ever get established?"

I think those who have argued and debated about the reward system for teachers understand the resistance to change and try to be sensitive to it. One of the reasons for the resistance is that it's such a big change. Another is the reluctance to alter a history of things with which we are familiar. But the whole problem seems to boil down to whether you can find a fair way--both to teachers who are being evaluated and to taxpayers who pay the bill--to reward people for outstanding performance. And it seems to me that of all the people in the country who ought to be able to do that, teachers should. All we're asking is that teachers, who grade our children A through F every six weeks, also be graded in a fair way every five years.

The problem is that teachers have nothing financially to look forward to. In Tennessee in many of our rural counties, the newest 7th grade teacher might make $12,000 for a 7-month contract. Across the hall is that teacher who everyone knows--a familiar person, the best in the county, the person who's had an impact on the lives of people for years and years--and that teacher, the best in the system, might be making $15,000 after 20 or 25 years of teaching.

It seems to me that our objective ought to be to restore honor and prestige to perhaps the most important profession in the country, that is, teaching. I wonder if many people have thought about what a prestigious position Master teacher would be in the community. It wouldn't pay as much as some professions, even as we've proposed it, but there'd be no more honored profession. Master teacher status would be something to look forward to, to aspire to, and it would help attract and retain talented and superior people. It's interesting to me that most of the initiative for establishing Master teachers comes from the South--Houston, Charlotte, Tennessee, Florida. This kind of change is not going to happen all over the country. I would judge that 12 governors will

recommend and fight hard for performance-based pay next year in the General Assembly. And that, by the end of the General Assembly of 1984, four or five states will have a statewide system. It is also my guess that, at the end of five years, virtually every state will have tried it, and half the states will have it. And, those states that have it will have the best schools; those that don't, won't have. The public will demand it, because they won't pay more for more of the same. According to the polls, they will pay more for improvements in quality. All we're really talking about is a way to pay people more for doing a good job and a fair way to pick which ones get the extra money.

Albert Shanker said that one of the reasons these proposals had failed in the past was because governors and legislators had failed to address "fundamental problems." He listed three problems: (1) Merit pay didn't involve enough teachers. (Representative Cobb will explain that merit pay would involve most teachers in the Tennessee system.) (2) Governors talked about proposals that took money from some teachers and gave it to others. (All of ours is new tax money on top of across-the-board pay raises.) (3) The teachers were not involved in the judgment. (Our proposal is based on the idea that the best evaluator of a 5th grade teacher might be two other 5th grade Master teachers and a Master principal who are familiar with that type of classroom in that kind of school system.)

I think one of the reasons this issue has been suddenly thrust to the forefront is because it is, and ought to be, the biggest women's rights issue in America. We've hired talented women (including my mother and my best teachers) at "bargain basement" prices over the years because they couldn't get jobs anywhere else. In 1940, the year in which I was born, 20 percent of the women in Tennessee worked outside the home, most of them in domestic work. The others were teachers, social service persons, or nurses. My guess is that today those excellent teachers would be going into accounting, engineering, and many other things, or would be sorely tempted to do so.

Where is the blame for all this? I think it is very important that we not blame teachers for this problem, or for our situation in education in this country. Teachers don't hire teachers. Teachers don't set teachers' salaries. Teachers don't establish the curriculum. Governors, legislators, and school boards do. So blame us! If we sit around and tolerate a pay system that causes us to lose talented people, it's our fault. And it's important to recognize that.

Let me conclude by saying that when I talk about this subject I always find myself talking about the teachers. And that's important. But it's the wrong focus. It is the children who are the more important part of this discussion. And, as our house speaker reminded me, probably the most important and attractive part of our Master Teacher proposal is that these best teachers will have 11- and 12-month contracts. That 11th month will permit about 12,000 of our

teachers to teach in June and/or August. Why is that important? It keeps the schools open. Why is that important in Tennessee? In our state, one out of three people who start high school don't finish, because one out of four 9th grade students don't have 7th grade skills. But what will happen in the 11-month system is that in the extra time period the best teachers will have small classes for 2nd graders who are behind in 15 skills and will work with them so that by the time school starts those students will be behind grade level in only five skills. We'll work with underprepared students right on through until every child who is not handicapped will have 9th grade skills. It's that simple, that attractive, and absolutely crucial to success. So we're very hopeful that somehow out of all this will come something that will help our school children.

We owe our most important debt of gratitude to the legislature's own Task Force on Public Education, which in January recommended Master teachers for Tennessee, using them in the variety of ways our proposal recommends. The legislature started it, I've carried it on a little way, and I hope they'll finish it in the next little bit.

Four legislators who sponsored the bill are here to talk about it: Representative Steve Cobb, a Democrat from Nashville; Senator "Buz" Elkins, a Republican from East Tennessee; Senator Dale Kelley, a Republican from West Tennessee; and Senator Jim Henry, the Republican leader of the house from Kingston, Tennessee. I'd like to ask Steve, who is also chairman of the Higher Education subcommittee of the Education Committee in Tennessee, to outline the specifics of the Tennessee proposal.

Representative Cobb. Thank you, Governor. First of all, there are two additional sponsors of the bill who could not be here: John Rucker, a Democrat from Murfreesboro, and another Republican, Senator Tom Garland. But we are not the only ones who worked on this bill, and many of our colleagues are with us today. I think it's important to know that a lot of people have invested a considerable amount of time on this legislation because it must be an effort of the entire legislature if it's to be successful. I believe none of us sees this as a panacea for education. This Master Teacher program is important and we think it's necessary and fundamental, but there are many other things that have to be done too--classroom sizes in the early years have to be smaller, materials are important, so is foreign language instruction, and other things as well.

We started with a program, and we have made some changes which we think have made the bill better. Most of our changes have come from suggestions made by our teacher friends, including members of the Tennessee Education Association as well as individual teachers in our local communities. We think the bill is better as a result of their input, and we stand ready to take further input to improve it. We do think the bill is probably in pretty good

shape now; what remains to be done, and there is a good deal, should not be put into legislation because of the detailed nature of it. For example, we expect that the rules and regulations which will specify what a carpentry teacher in a shop must do to become a Master carpentry teacher, as opposed to what a French teacher must do to become a Master French teacher, probably should not be spelled out in legislation.

The Master Teacher plan, of course, can't be officially implemented until the bill is passed. First of all there were certain questions about politics. Republicans and Democrats, liberals and conservatives are sponsoring this bill, and some of each group have some questions about it. We have attempted to take out partisan politics and the local politics which teachers say they fear. I think we have been successful. For example, we have one certification commissioner at the statewide level, and three at regional levels. They, not the local school system, will make decisions about certification.

Secondly, teachers fear that a Republican governor might choose only Republicans to serve on the state certification commission for Master teachers; a Democrat might choose only Democrats. We have made sure, to the best of our ability, that this cannot happen. The governor will make recommendations for the commission at the state level; the recommendations will be subject to confirmation by both the House and the Senate. If we feel that it's tilted too much toward one party or in one direction, either house can veto it. While that may not seem too radical, in Tennessee it is a great departure from the way we normally do things; confirmation is not one of our normal processes.

In addition, the regional commissions that will make most of the decisions will not be chosen by the governor or the legislature, but by the state certification commission itself. In short, we've attempted to remove local and partisan politics, the kind of machine power-building that we've all seen.

We were also told that not enough teachers would benefit by this program. Originally our plan called for the stipend to begin after eight years, upon reaching the third level, that is, Senior teacher. Our teachers said to us, "That's not a very good inducement for people to come into the program; they should get something sooner." We thought that was probably correct, and with the help of Bob McElrath, commissioner of our Department of Education and his staff, we came up with a way to fund an additional incentive step.

The first of the program's four steps is that of Accredited teacher, which in Tennessee pretty much corresponds to a probationary teacher. If you're rehired by your local system for a three-year period, you're granted tenure under present law--which is not touched directly. Although at one point it is circumvented, tenure remains in the code. In addition, at that time, you must receive a state certification for the next step, that is, Professional teacher.

We reduced the stipend for Master and Senior teachers a little, and will use that money, plus certain savings that we generated in other ways, to allow an across-the-board $1,000 step increase for every teacher who makes that first step from Accredited to Professional. This is entirely consistent with the notion of rewards for moving through career incentive steps. We really prefer the term "incentive pay," not because we're afraid of "merit pay," but because we think it is simply not accurate The financial reward is not given because of a popularity contest voted at the end of the year. This plan provides, rather, a series of incentive steps throughout a career, designed to keep good teachers in the classroom, and pay them what they would get if they followed the current practice of going into administration, real estate, or some other profession that pays more.

After the Professional teacher, there's a five-year period in which you exercise your certificate. At the end of that period, you are then eligible to go to the third step, which is the Senior teacher. At that level, you're given an option to work under either the present 10-month contract or an 11-month contract. The amount of the stipend depends on which contract you select. If you select the 10-month contract, the stipend would be $2,000. If you select the 11-month contract, the stipend would be $4,000 in addition to all other pay and benefits, including the various traditional pay steps for education and time of service. The stipend is entirely additional. This is a "carrot" plan, though there is the "stick" of possible loss of certification after a number of years. Largely, these are rewards designed by incentive.

At the end of the next five years, that is, approximately 12 or 13 years after beginning teaching, a person is eligible to try for the final step of Master teacher. If the teacher elects a 12-month contract and is successful in getting a Master teacher certificate, he or she is awarded a stipend of $7,000 per year above and beyond everything else, which, of course, is approximately $35,000 per five-year certificate. That is real money. We do not believe that the very best teachers can be made to work any harder because of $35,000, but we do feel that it is only just to reward good teachers and to give an incentive to others to do a little better. Eighty-seven percent of our teachers who elect to go under this system--and no teacher who presently teaches has to go under it if they don't want to--will benefit in some way by this program, at the $1,000 level or up to the $7,000 level. We believe this is meaningful for most of the profession and will constitute a real incentive.

There has been a question about whether or not this stipend will remain valid, inflation being what it is. The fact that it's set at a specific level of $7,000 has caused some problems. We have placed in the bill a requirement that at least every four years the General Assembly must review the stipend for adequacy and, if necessary, raise it.

There has been discussion about other problems, or alleged problems, with the program. One of them is what is often referred to as "quota." For reasons of fiscal responsibility, the state obviously cannot promise to pay every teacher a Master teacher stipend. If everyone made Master teacher, we would still need to have incentive steps beyond that because we want to keep people with a goal in mind--to work toward something better.

We have raised the number of Master teachers that the state is willing to pay for from 10 percent to 15 percent of the local teacher population in a given school system. In addition, 25 percent can receive Senior teacher stipends. This is a total of 40 percent of all teachers, and about 60 to 70 percent of the teachers who have the time and service to be eligible. We think that's a marked improvement.

I referred in passing to the fact that we allow teachers an election between 10- and 11-month contracts for Senior teachers, and 10-, 11-, and 12-month contracts for Master teachers. We think this option is an improvement, as many teachers have told us it would be impossible to work year-round.

In speaking of the plan, we usually refer to a Master teacher; but there is also a Master principal and superintendent. We've raised the number who can attain that status on the advice of people in the school system. Perhaps our greatest need and greatest problem is at the supervisory level. Those are the people that we think really need to be brought along. We have reduced the stipend--which was originally more--for the administrators to the same as that for teachers, in an attempt to generate equity. Further, we have made a provision that I think is very important--that is, the Master Teacher/Principal Academy. As many of our colleagues have pointed out, people are not really trained for evaluation, although evaluation is called for under present law. However, in many places, evaluation is not really being done in an efficient way; therefore, we propose to train principals and supervisors to do this job properly.

We've also taken from the Tennessee Education Association (TEA) one of their provisions regarding teacher preparation. We do think that preparation was something that wasn't addressed in the original proposal; we have addressed it in this proposal. We believe that a study must be done to address what kind of youngsters are electing to go into teaching, what kind of preparation they are receiving, and what kind of meaningful evaluation is being given to them. We've also taken much of the TEA section on due process. Although the details of what you must do to become a Master French teacher cannot and should not be spelled out in legislation, a grievance process has been written out in some detail. I can't claim that this is the best possible grievance process, but it is very detailed, and we are willing to make changes if that becomes necessary.

I guess the last couple of things we might say would be this: we have tried to put in protection for the present teachers. I've alluded to the fact that no teacher has to go into the program; but, if teachers presently in the system do elect to go into it, we have provided an option. They can try it out; if they feel that they have not been treated fairly, they can go back and get their old certificate and keep it. We think that's essential to making this acceptable to people who are faced with a whole new way of doing things. Furthermore, if they do receive the Master, Senior, or Professional teacher license and over the next few years find, as we don't expect, that politics have gotten into it too much, they can still go back and get their full former certificate.

Finally, we have tried to make sure that a local system cannot abuse this procedure. We have great faith in local systems, but we believe there's a balance between the region and the local system. Once the Master teacher or Senior teacher gets the certificate, and gets hired by the local system, it's a dual decision. They cannot be terminated from this stipend, except for cause, until the end of their certificate. In short, one teacher won't get the Master teacher stipend one year and be removed the next year so that a newly certified Master teacher could get the stipend. We felt that would involve too much local politics. I think the other sponsors probably have a few comments.

Representative Henry. I'd just like to say that, being from a rural community, I was most interested in one thing about this bill--to see that the rural communities were being treated fairly. Right now, what's happening in our state is that a lot of good teachers are driving into the larger communities to teach school because salaries are generally higher. So what we want to do is insure that each system has a proportionate number of Master teachers and Senior teachers. In that way, we can keep our best teachers in rural communities. It will allow us to compete. More than anything, we wanted to be sure that each rural community could have a supplement on a proportionate basis to avoid losing our best teachers to the areas that have the big money.

Representative Kelley. Well, we, the sponsors of this legislation, didn't know exactly where we were going when we began this project. But, at the same time, we knew where we wanted to go, so we kind of felt our way along. I live in rural west Tennessee where 40 percent of the population does not have a high school education, and I thought that by this proposition we would be able to address issues as they relate to rural west Tennessee. I've been a school board member for nine years and have served in the legislature now for five years, and I'm on the Education Committee. I thought this was a great opportunity to discuss, and try to solve, some of those problems that have been brought to my attention over that tenure. I'm pleased to be a part of this legislation and look forward to working even harder to get this proposal into our schools in the state of Tennessee.

Senator Elkins. Like other members of the legislative panel, I have been deeply involved in educational improvement for the last several months. I suppose I first got really interested in the whole idea of doing something to improve the quality of education at the SREB Legislative Work Conference in Lexington a couple of years ago when discussion focused on the SREB Task Force report, The Need for Quality. Then, last year we had the first comprehensive study of education in Tennessee in 25 years. That study group was made up of educators, lay persons, teachers, and others interested in the area of education. I was further impressed during a meeting of the Education Commission of the States last year. This meeting focused not only on our schools in the Southeastern states, but on a national basis, as compared with those countries against whom we compete in the economic world. Our education system has to measure up and two speakers summarized the problems in immediate terms when they said that the rearmament of our education system is equally as important as the rearmament of our defense system.

Governor Alexander brought forward his Better Schools Program about that time, and I think he touched a sensitive chord with most legislators and most of the general public. We introduced the bill in January, and have been working on it ever since. We've been trying to get it in some form that will be palatable to the legislature and to the teachers and education community that it affects, so that we'll have the support of the taxpayers who are going to be asked to dig into their pockets to pay for this program. I've been in the legislature for about 15 years now, most of that time I've been on the Education Committee, and to my knowledge, this is the most innovative and forward-looking program that I've seen. I think that what is important for us in Tennessee is to further refine our bill to gain the support of the public and of the education community. Even if we have the best draft bill, if we do not have the working relationship that we could have with the people involved, it's not going to be worth the paper it's written on. I want to congratulate SREB for taking the leadership role that you have played in bringing this issue not only before the national agenda, but especially before the states in the Southeast.

Dr. Godwin. Thank you, gentlemen. Let's look now at another plan, the so-called "Career Teacher Plan" of the Charlotte-Mecklenburg school system in North Carolina. This is a plan that incorporates teacher training as well as incentive pay. It is modeled somewhat along the lines of the professional ranks in our colleges and universities. Jay Robinson, who has been superintendent of this school system for the last several years, will tell us about the plan.

Dr. Robinson. I want to make it clear that we don't think we're in a crisis situation in North Carolina. We think our schools are good and are getting better. In Charlotte we feel like we're really on a roll with education, and we believe we can document that. We've been trying for several years to

concentrate on improvement in achievement, attendance, and student behavior. Our test scores are at an all-time high, well above the national averages; our attendance is at an all-time high; our student behavior is the best it has been in recent years; and our community support is high. There are many improvements we need to make, but we didn't go into this plan because we felt we were in a crisis situation. We did think the evidence was clear that unless we make some radical changes, we were going to be in very serious trouble in the near future.

In 1966, of the folks in the freshman classes of colleges and universities in this country, 22 percent said they were going to major in education; in 1983, 4.7 percent of the college freshmen said they were going to major in education. It usually takes 10 percent of the college graduates to staff all the jobs in education in grades K through 12. So, inevitably, there is going to be a teacher shortage unless we turn that around. Even more important, and what's so frightening, is the quality of those who are going into the teaching profession. On the average, this year's freshman class of education majors is running 80 points below the SAT mean score for freshmen in other fields. That ranks right at the bottom for the first time in history. We're frightened about that and we want to turn it around.

So we started out to develop some type of plan that we felt would make a difference and would bring in good folks and guarantee that they stay in the teaching profession--just getting them in is not enough. We're getting a lot of folks coming into our system, but we know that at the end of 10 years half of them have left the classroom; in 20 years two-thirds have left; and only one out of five is staying for 30 years or more. We're concerned that the wrong one out of the five is the one who is staying.

When we started exploring possible solutions, one person said, "If you give every person a $10,000 raise, the problem is solved." That would solve most of the problem, but it is as unrealistic as anything could be. Anyone who believes we're going to get the kind of raises we have to have to be competitive with middle management salaries in industry is naive and unrealistic.

So we set out at the beginning of 1982 to try to develop a plan for bringing about some changes. We noted in going into this that most of the efforts that have been made in this direction have been tentative in nature. Most efforts in merit pay are somewhat punitive. I'm not critical. They're perceived that way, and to a degree they are punitive for some people within a system. We wanted to try to overcome that. I appointed a committee of 12--four teachers who were leaders in teacher organizations and teacher unions, four administrators, one board member, two community leaders, and the associate dean of the School of Education at the University of North Carolina. That committee worked for the first half of 1982 and came back with a concept and the skeleton of a plan which we'd be comfortable developing and living with.

The basic things that we're dealing with include a way to attract good recruits, a way to train them in a probationary period of four to six years, and a way to tenure teachers who have met the training requirements, have documented excellent performance over a substantial period of time, and show potential for continual growth and development. Training is a very important part of our plan, as is linking incentives to achievement. These incentives will provide salaries and status to teachers and will attract and hold higher quality people. That, very briefly, is what we're talking about. I want to be sure you understand that we're not only talking about new folks coming in, although perhaps that is the major thrust. However, we certainly have people presently employed who can opt to go into this program, will be encouraged to do so, and will have an opportunity to do so, but will lose nothing of their present status if they do not. I think this is similar to the proposed program in Tennessee.

Now, in order to effectively implement such a plan, we determined early on that a change in the North Carolina tenure law would be required as far as the Charlotte-Mecklenburg schools are concerned. We thought, being very naive, that wouldn't be very hard to do; but it wasn't quite that simple. Tenure is automatic in North Carolina at the end of the third year if teachers, principals, or administrators other than superintendents are re-employed. We asked to have the flexibility of granting tenure after four, five, or six years, and then if someone was re-employed a seventh year they would have tenure.

We got the bill through the House committee without any trouble and thought we were in fine shape. Then, the North Carolina Association of Educators went to work on us, and the next morning we lost the bill on the floor. We worked all night and cashed every green stamp we had. The governor came out to help us, got the bill revived the next day, and stayed in the struggle for about six weeks or so. A couple of weeks ago, we received final approval in both the House and the Senate. We now have a statewide bill that permits the type of flexibility I just described in units with 70,000 students or more. (We're the only unit that size so it only applies to us.)

We now have another committee made up of 21 members: nine teachers, nine administrators and other staff people, the head of our staff development center, and the dean of the School of Education at UNC-Charlotte. This committee is in the process of putting the final touches on our plan, which involves establishing the exact entrance requirements and finalizing details of our evaluation process. We already know the evaluation process will include multiple evaluators, rather than the principal alone.

The plan permits teachers at the end of a 30-year career to make from $30,000 to $40,000 in salary if they get all the raises for which they would

be eligible. We believe that our plan is focusing on something that is extremely important--we're not interested only in recognizing and rewarding excellence, we're interested in creating Master teachers. Through the training and the other things that we can give them, we believe that we can create Master teachers. It will probably require two years for teachers presently employed to gain career status under this plan, but it will require a minumum of four years for new teachers, who will have four, five, or six years to attain career status.

The last thing that I want to emphasize is that we have three steps in the career plan--Level I, Level II, and Level III. We're not requiring a master's degree for career status, but we're requiring the equivalent of that. I don't want to be too negative in saying this, but we're not much on canned degrees. We are very heavy on our own staff development programs, and we want to tailor whatever training we have to the needs of the teacher. Some folks in higher education are having a hard time agreeing with us, but we don't believe you have to go down to a college campus and stand around the old well to get an education. We believe that teachers should be trained right on the job. We know the universities have a great role to play in providing a quality undergraduate degree. We know they have a great role to play in research. But our program will bring a teacher the equivalent of a master's degree for Career Level I, the equivalent of an advanced certificate or six-year program for Level II, and a doctorate for Career Level III. Those in Career Level I will have a leadership role in the school; those in Career Level II will extend this role in their area; and those in Career Level III will provide leadership on a system-wide basis.

We believe that this change, the type of changes we're talking about, must come about in this decade. We believe that unless we make such reforms, we will never have better teachers.

Dr. Godwin. Now we're going to look at the experience in recent years of one of the largest school districts in the nation, the Houston Independent School District in Texas. Under the leadership of Superintendent Billy Reagan, a variable-pay program has been in place for several years, dealing with special kinds of problems. Superintendent Reagan will tell us what has been done so far with respect to incentive pay, how it has worked, and what is being planned from here on out.

Dr. Reagan. The task I'm going to deal with in depth is incentive pay for staff. In 1986-87, we'll have a beginning salary schedule in Houston of $21,000. A teacher with 20 years of experience and a master's degree will have a base salary of $38,000 plus our "second mile" stipends. Some 2,000 to 3,000 of our teachers will be making in excess of $40,000 for 185 days of service.

In addition to that we are going to a year-round school program. Those teachers who participate in the year-round program will have the potential to make in excess of $50,000 as classroom teachers.

Let me tell you just a little bit about our school system so that we have a commonality of understanding. We have 194,000 students. (I'm told that we have more students in our school system than the states of Arkansas and New Mexico combined.) We have an 80 percent minority student population--nearly 45 percent black, 30 percent Hispanic. We have 30,000 youngsters who do not speak English. We have 22,000 handicapped students. We have 12,000 illegal alien children in the school system, including 1,000 from El Salvador. In 1982, we had 10,800 teachers. Our professional staff is about 45 percent white, 5 percent Hispanic, and 50 percent black. In terms of per-pupil cost, this year we're spending about $2,184 for operating expenses and a total of $2,200.

We went to truth in education in assessing the progress in our school system. In the early Seventies we had the lowest achievement scores in the total history of the school system. In 1974, the year I came to the school district, we decided to turn this around. We asked: "Why is this happening?" I'll have to give the business community a great deal of credit for what's taking place with the progress we have made, as shown by this year's achievement scores. At the elementary level, with the student population I described to you, we're at or above the national norm in grades 1 through 6. In grades 7 through 12 this year we have the greatest academic growth in the history of the school system. A Nation at Risk pointed out, tragically, that 10 percent of all the 17-year-olds in America are functionally illiterate, and 40 percent of the minority youth are functionally illiterate. We point with great pride to this year's senior class, 97 percent of whom were certified as functionally literate, meaning 8th-grade minimum competency.

We have learned that there are two fundamental elements in learning: time-on-task--more time in the day, more time at home, more time in the summer; and motivation--through incentives, standards, caring, and the other elements.

We've totally emphasized the time-on-task and motivation principles in our magnet school programs. These programs address the interest and means of individuals. For example, Poe Elementary School is located in an affluent neighborhood. We bus more than 50 percent of the student body from the ghettos and the barrios. Poe is a fine arts magnet, a math and science academy, with a 50 percent black and a 50 percent white teaching staff. Achievement scores at Poe for the last four years have been in the top 95 percent of the national scores. We think those scores should destroy the myth about whether black kids can learn or brown kids can learn, and we should quit

arguing about whether black teachers can teach white kids and white teachers can teach black kids. A great deal of time and effort have been wasted on these myths. Another example is Bel Air Senior High School, a magnet school with an international baccalaureate. Bel Air High School had 21 national merit simi-finalists in the top 10 percent in the nation this year, largely due to the international baccalaureate program, which cost some $20,000 to implement plus a lot of hard work and great teachers to keep it going. If you doubt what I'm saying about magnet schools, look where the National Achievement winners came from last year.

In our school district, we looked at educational deficits, and we looked for the why. We added an incentive plan. One of the reasons for educational deficits was the high rate of absence. So we set a standard permitting only six absences (excluding certified illness). If there were more absences, the student would fail the course. Since we put this standard into practice, we've had a problem--we don't have enough parking space.

We also turned to the Board of Education and instituted an incentive plan for students. We asked for $125,000 to buy tickets to Astroworld for all kids who had perfect attendance, for the class with the highest attendance, and for kids with all As and one B. Would you believe that week before last out of 194,000 students we had 30,000 kids who had perfect attendance this year? Will incentives work? They will work beautifully. And a good deal of our success is due to activities with the business community. We have 8,000 volunteers, and companies and clubs have given us support for scholarships and for computers and other needs.

A look at our changing student population--we've gone from dominant white to dominant black, and we're moving toward dominant Hispanic--shows that we're going to need 40,000 new teachers in the next 15 years. When you consider retirement, we're going to need 100,000.

We must also look at student preparedness. College and university studies indicate that 65 percent of the kids in our schools want to go to college and get a degree and become professionals. No more than 35 percent of them are enrolled in academic courses that would get them into any college that has any selectivity whatsoever. The issue is expectations versus reality.

In Texas, in the five years between 1976 and 1981, we experienced an 18.2 percent decline in enrollment in teacher preparation programs; in the six years between 1976 and 1982, the decline was 32.9 percent. We've also experienced a decline in SAT scores that brings us below the national average for education majors. At the same time, we should look at salaries. At present, we have a $16,000 beginning salary; with 20 years of experience,

teachers with a bachelor's earn $24,000; with a master's, $28,000; with a doctorate, $30,000. Our salaries are higher than the national average for principals, teachers, counselors, etc.

To be eligible for the incentive pay plan, a teacher must be employed full-time, have a satisfactory evaluation, and have no more than 15 days of absence a year averaged over a three-year period. The plan has six categories. The first component is teaching in high priority locations. It's more difficult to teach in a high school in an inner-city ghetto than it is to teach in the suburbs; those teachers who do will get a $2,000 stipend. Secondly, if they teach subjects with critical staff shortages--math, science, or bilingual education--they get another $2,000. The third component is outstanding teacher attendance. If they have perfect attendance, we buy back a day, at an average of $100 a day. How would you like to have 98 percent teacher attendance this year? We do.

The fourth component provides professional growth stipends, for taking instruction in computer science or bilingual education, for example.

The fifth category is the center point of the plan--outstanding educational progress. We have a computer model that predicts within a very narrow parameter what the academic growth of a school should be. If the school meets that prediction, all the teachers in that school get an extra $100 stipend on December 18. If the school is in the top 10 percent of academic growth, teachers get another $400 to $1,200. So for the math, science, and bilingual teachers at Yates High School this year, there is potential for $5,200 in stipends.

The sixth category is unique campus assignments. Seven special school sites are named, and because no test data is available for them, teachers are not eligible for the outstanding educational progress stipend.

Last year we put $6 million out of a $220 million budget into the program; this year the amount is $11 million. Does it work? We've reduced average absences for our teachers from 9.0 days in 1978-79 to 7.4 days in 1981-82. We have incridible turnover, yet between 1978 and 1981, we've reduced resignations from 10 percent to 7.2 percent and total turnover from 23 percent to 17.1 percent. When we started on September 1, 1979, we had 368 beginning-of-the-year vacancies out of 10,000; this September we had 62. As for critical staff, we started off at 195 vacancies; this year we had 30. On April 25 this year, out of 10,600 teachers, we had 40 vacancies. We had one computer science vacancy and no math vacancies.

What we are entering into now is the Houston Plan for Excellence in Education. The 1982 test scores for the Houston Independent School District

for grades 1 through 5 were one to three months above the national norm; grade 6 was at the national norm; and grades 7 through 12 were three to nine months below the national norm. If you are wondering why the secondary test scores are not going up any greater than they are and why the elementary scores are doing as they're doing, let me tell you what we believe is the reason for this great deficit. We gave 65 percent of our upper elementary teachers an 8th grade minimum competency test. Nine percent of them could not add a series of whole numbers; 42 percent could not add whole numbers in a word problem; and 24 percent could not round to a whole number. Deficiencies in grammar, spelling, and written communication skills have also been well-documented. The problem is that a teacher can't teach what he or she doesn't know.

If we fail to give attention to the teachers we have at the present time, we will not deal with the issue of quality in education. Therefore, the Houston Plan for Excellence has three components: a staff component, a parent component, and a business component. We have raised the graduation requirements. Over the next two years, we're going through a proficiency certification program for everyone in the school system, from the superintendent to the head custodian. Functional academic skills will be tested through the Pre-Professional Skills Test (PPST) or through a staff development program with appropriate testing. Certification for content will be through the National Teacher Examinations (NTE) or through a staff development program. For classroom observation, we've developed a tri-dimensional assessment process that's working beautifully. Assessment is made by the principal, supervisor and associate, or deputy superintendent. Assessment for managers and administrators will be through Southwestern Bell's Management Assessment Center, the finest in the nation.

I wish I could go on and on, but that's how we're trying to convince the community and the business community who have said, "You get your act together, and we'll help; you'll have $50,000 salaries in two years."

PRESENTATION OF SREB REPORT: HIGHER EDUCATION AND HIGH TECHNOLOGY ECONOMIC DEVELOPMENT

Charles W. Minshall, Battelle Institute, Columbus, Ohio

Several months ago SREB contacted the Battelle Institute about their concern with the whole question of high technology activities and the extent to which this topic is misunderstood--that is, the number of communities that appear to be directing economic development strategies exclusively toward establishing high tech programs, perhaps without knowing exactly what is involved. SREB asked the Battelle Institute to carry out an assessment of high tech activities that would define and relate the most important characteristics of this significant economic change to the SREB region.

The future of the region lies in growth industries as opposed to high technology activities. What's important to note here, however, is the relationship between growth activities and high technology. Probably 60 percent of all new jobs that are going to be created in the future will be in the high tech area. So, growth and high technology are very much intertwined. It's a complex issue involving locational criteria and operational factors that are completely different from those with which many developers and community leaders have dealt in the past.

When analyzing high technology activities, we must consider that high tech industries include computers, research, electronics, and metal fabrication, among others. These are industries. What a lot of people don't realize is that to be ready for high technology, you have to know where you fit within this industry continuum. Many of these industries involve research and development (R&D) centers, research and engineering (R&E) centers, as well as major manufacturing plants. And we can take this continuum perhaps a little bit further and find out that distribution is required, and there are headquarter activities, data processing, service and repair. For many smaller and intermediate-sized communities seeking a role, perhaps a component of manufacturing or certain aspects of data processing would be much more important and realistic than trying to attract R&D centers.

Identifying high technology activities and how they relate to specific industry is essential if the community is to estimate the occupational and educational requirements of the firm and the extent to which it can meet their needs. This is a difficult process, involving some different criteria than we have used in the past.

For example, when we started to identify high tech activities, we started to use factors such as wage rates. If you use wage rates, you end up with the auto industry. If you use factors such as productivity or output per production worker, you tend to end up with things with lots of pumps and machinery, such as petroleum products and chemistry. You can go through your normal indicators and you don't really come up with high technology. So, we gave up trying to identify high tech activities by using standard measures and analyzed 25 high tech activities to see what set them apart. Several things popped out.

By far the dominant characteristic of a high tech activity is investment in research and development. When you rank activities according to what they are putting into research, it reads like a "Who's Who" of high technology--electronics, computers, drugs, pharmaceuticals, metal fabrication, food processing, ordnance, biomedical equipment, and so on. What's the significance of that? The industries that have this investment in R&D tend to be those that have a great requirement for scientists and engineers overall; they tend to be those that establish freestanding R&D centers. The second characteristic is occupational structure. The high technology activities are dominated by professional and technical employees. If we were to visit a typical manufacturing establishment in apparel or textiles, we might find one to two percent of the work force in a professional or technical category. But if we went to an electronics plant or an instrument plant, we'd find that perhaps 15 to 20 percent to as high as 30 percent of that activity involved scientists, engineers, and technicians. The real definition of high technology is in R&D expenditures and in this dominance of the scientific and technical groups of employees.

What we don't want to lose sight of is that the largest number of jobs are in the operative category and in the craft category. Therefore, there is a critical need to have the finest types of technical training available. High technology activities require the highest levels of educational attainment, often two to three years higher than the non-high tech types of activities. Where things get a little fuzzy is when you go beyond criteria such as R&D, occupational structure, and educational attainment. These are oriented toward technical linkages, that is, there's a tendency for high tech activities to have technical ties to other high tech and scientific industries. But, in 90 percent of the cases, they do not have very powerful requirements in terms of energy, sites, structure, or transportation; they tend to be very footloose. These industries are oriented toward people and toward very high quality types of locations, but beyond that they can go almost anywhere. This is why they are so extremely desirable, but it is also the reason there is such an extreme amount of competition to get them.

High technology industries engage in an extremely diverse group of activities: food processing; paper manufacture; metal fabrication; a number of types of machinery--construction machinery, energy machinery, transportation equipment, in addition to the ones we always hear about; computers; electronics;

drugs and pharmaceuticals; and instruments. You have semiconductors, and you also have optical equipment. You have biological products, and you have construction equipment. Agricultural chemicals emerge as being extremely important. And I have not mentioned all of the high tech industries. These are the activities that are growing nationally, and are also growing most rapidly in the SREB region.

We took this analysis one step further, and we defined something called "new" or "emerging" technological activities. Most of the activities that I've talked about are those that are here and now--they're operating now with plants and offices and are creating jobs. But there are a number of activities which will be growing very, very rapidly in the late 1980s and early 1990s--genetic engineering, fiber optics, more in the area of robotics, medical equipment, satellite communications, and various types of composites and lightweight material. These also tend to be defined very clearly in terms of the technology content, occupational structure, and the educational level of the people.

Once we completed our definition of these types of topics, we moved on to a couple of other subjects of great importance to SREB, simply because they are closely related to the university. Before I go into this, I want to point out that, traditionally, economic development planning has taken educators and universities for granted. To be candid about it, education was the one section of the community profile that had half a page or maybe one page. People are now aware that the university, the educators, have to be critical elements in the economic development programs, or nothing is going to happen--nothing at all.

Two specific areas have emerged as being critical for the attraction of high technology economic development: the question of high tech parks or sites with a university involvement, and the new role of the university itself. Science parks and science centers are receiving a tremendous amount of interest. Virtually every place you go in the U. S. you hear of Research Triangle Park, Stanford Research Institute, and Route 128 around Boston. There are highly successful locations for industry in the U. S. that have a number of similar characteristics: they are university-related; they are oriented toward the attraction of scientific and technical activities; and they are extremely high quality locations for a very wide range of economic activities, that is, they are not limited to science and technology but also are adaptable to manufacturing, office jobs, and certain types of services. You can't point to a single successful science park in the U. S., but you can point to a great number of very successful high tech parks.

The whole concept of the science park or high technology park started to get under way and grow in the early 1960s, expanded through the Sixties and

the Seventies so that there were probably 75 to 80 true high technology parks by the mid 1970s. Beginning about 1979-80, that situation began to change. In the last two or three years, literally dozens of high tech parks were established--some of which, however, are still in the planning stages. In order to understand the successful ones, we have to look at the question of definitions a little bit more. I said there's probably not a single successful science park in the U. S., and that's true. I'm talking about the type of park that accepts only research and development activities, and nothing else. There are successful parks that focus on technology and scientific activities, and limit production and distribution activities. The next step below is the traditional industrial park, which permits distribution and manufacturing.

The successful high technology park tends to be that located in close proximity to high quality residential areas, good housing, good schools, and a good pool of technical personnel, to high quality air transportation, and to a community with a good university--I can't stress enough the importance of shared university facilities, cooperative university programs, facilities for recruiting university graduates. Perhaps the most exciting high technology parks that are coming along right now--and the ones that will probably be most successful in attracting the true types of high technology activities--are very closely related to universities and have a direct university involvement.

Across the Southeast, right now, we have the largest number of successful projects in stages of being implemented or planned. In most cases, the university is a partner in the development and may be an owner; there is staff released time; there may be shared facilities initially; there may be direct research support for the industries that are going to be located there; there may be shared computer facilities. In other words, the university is an actual tenant, facilitator, operator, and partner in all components of the new type of high technology park that we see developing right now. We see this trend moving even one step beyond this. We see the successful high tech park not only as a high quality type of real estate development, but also with an increasing amount of the university involvement. We see increasingly the role of the university as actually setting up the innovation center, the center of excellence, and the other types of things that go with it. So when you're talking about science parks and high technology parks of the future, you're talking about the university becoming involved. Many communities are moving toward this end, the successful programs will be those that have this type of support.

What about the actual role of the university itself? This is extremely important. Only five or 10 years ago the universities were the add-ons in economic development. When a prospect came to town, he met with the bankers, the Chamber of Commerce, perhaps a couple of realtors, perhaps somebody from trade, other manufacturers, and, if he had an extra hour,

perhaps a professor or the superintendent of public schools was routed out. That has really changed. In many communities, there are "high tech councils" that are just as important a part of growth programs as the old industrial development council used to be, or the industry attraction task force. The university now has a role not only in the attraction of industry, but in many cases in actually advising the developers on the types of industries they should be going after, meeting with prospects, and actually moving ahead from there.

First of all, the traditional role of a university is one that's extremely important: providing people. We do need scientists; we do need engineers; and that's just as important as it's ever been.

The second type of contribution is new. We now see the university as being a facilitator in the economic development process, working with a prospect and with existing companies. Before I get into this too much, there are a couple of caveats that we ought to mention. In high technology activity, the continuum is important. The roles of the scientist and the engineer are extremely important for the R&D center, R&E center, and many types of manufacturing. But in certain types of manufacturing, the role of the technical schools becomes equally important. So we have to talk about both types of postsecondary education. But one thing is especially clear; if you're talking about attracting large high tech industry, you're talking about communities with major universities offering four- and five-year programs and Ph.D. programs, especially in all types of engineering. It does not have to be a national university. I don't know how many of you have thought about how many major high tech industries have been attracted to Columbia or even the University of Chicago lately, but the number is very few. The idea is to have a good engineering school with a good program.

Traditionally the university has not played a pro-active role in economic developments. And the truth of the matter is, that although many of the most highly touted high tech developments have been attributed to universities, in most cases, the real credit goes to developers, the governor, and the economic development people. The fact remains that today the universities can be the great facilitators.

What's the form of these things that we see coming? First of all, and especially critical, is the question of making university resources available. If you're going to talk about attracting high tech activity, you have to talk now about sharing some computer time, sharing some facilities, sharing some lab space as mechanisms for attracting industry. You have to talk about cooperative research programs. Perhaps the greatest inducement you can offer many of the high tech firms is to make available shared expenses and shared facilities to cooperate on special topics of interest.

You also have to encourage--and this is extremely important--consulting contracts by your professors and senior staff people. In many cases the first step toward strengthening high technology in a community comes from the work that is carried out by a professor or a graduate student as a consultant. At least two types of industry affiliation programs are needed. We have to have the universities: (1) Putting together affiliate programs to try to line up high tech activities and support research. (Increasingly, we see a movement toward the establishment of various types of consortia designed specifically to carry out various types of high tech research.) This could be termed industrial extension services with a high tech thrust. (2) Establishing incubator space facilities on campuses to facilitate the spin-off and retention of activities from scientific and technical people in the community. Faculty involvement, incubator space, the question of shared facilities, staff release, the question of university sponsorship of various types of research to get it moving, the establishment of centers of excellence are all essential. Especially important, and what I think may account for one of the greatest advances yet, is the establishment of application centers.

Also important is getting people straightened out about the difference between a high technology or science park and R&D centers. A number of individuals have made almost a business of going around and telling everyone in virtually every community that they need a Research Triangle Park or are qualified to have one. Or, if they find there's a local community college or four-year college, they would try to promote a "center for excellence." But what a lot of people don't realize is that when a university gets into the R&D business in institutes and centers of excellence, it is selling and contracting services that are capable of providing positive results. We now have coming along this idea that we need an applications center where this R&D facility, in addition perhaps to selling its services in a badly needed technology, would also be a major facilitator in working and helping industries in that particular city or region to develop and expand. For example, if you're in an area with an old manufacturing base, perhaps you move into robotics, or electronics, or some type of polymers. The applications center is now the most important mechanism for branching between the university and the private sector.

I'll just finish up with one other comment here, and that is that projections of the U. S. economy show a leveling off of growth in many parts of the nation. A shaking out of industries is going on right now. Some of the old traditional industries are going, and we're losing jobs. One of the greatest needs we have right now is to facilitate the retention of industry, the expansion of industry, and the spin-off of industry. Perhaps the most important contributor to doing that is the university working with industry in a relatively formal setting, such as the applications center. So, in closing, if you're talking about attracting or developing high technology industries, you're talking about the universities and the technical schools. Rather than being on the back page of the industry prospectus for a given community, the universities are now on page 1.

THE STATE ROLE IN HIGH TECHNOLOGY DEVELOPMENT

Bob Graham, Governor of Florida
Charles S. Robb, Governor of Virginia

Governor Graham. Dr. Minshall started his presentation with a semantic question: What does high technology mean? I think that's the appropriate place to begin and I would suggest that for state policymakers, that issue ought to be defined, not from a dictionary, but from a standard of what are the public policies that you wish to achieve--defined as relevant. I would suggest that the two public policies which are especially relevant in the South are (1) economic development, and (2) growth management. It is clear that our region is looking for a broader range of economic activities for its people than has been its tradition. In Florida today, half of our people are still employed in our three traditional sectors: agriculture, tourism, and construction. Our goal is to maintain the strength of those three traditional pillars and to add strength through emphasis on technological industry and on international commerce so they become part of our basic economic strategy for the state.

Our region, and this state, are fast growth areas. All of us are confronted with the question of how we accommodate the substantial growth that we are experiencing. I have visited most of the centers that have been identified outside of the Southeastern region as the high tech centers of America--specifically, Route 128 and Silicon Valley. I sensed particularly in Silicon Valley, which I think has the greatest relevance to the South and particularly to this state, that there was an absence of consideration of the growth management implications of what they had done. They have compacted so much activity in a constrained area that they are now suffering second and third generation problems. They have very high real estate costs and difficulty in securing housing for all but the highest paid individuals, therefore contributing to a sharp escalation of wage schedules; and there's a very extensive shortage in almost every area of infrastructure from electrical utilities to transportation.

I believe that the strategy for a growth state looking at high technology as one of its economic policies should be to think of how you want to distribute that high tech in such a way that it will contribute to a rational pattern for your state and not exacerbate problems. So, I define high technology as industries which will contribute to those two policy goals--economic diversification and growth management.

I see three principal ways in which higher education can be a positive force in influencing high technology industry into a community and then,

secondarily, influencing its role in growth management. Higher education should exert influence as it relates to education in the three areas that a high tech industry typically explores.

The first and most fundamental is the quality of the public schools. People who make the decisions on where high tech industries will locate are well-educated people. They are concerned, and they put a high value on the education of their children. They understand that in order to attract the quality of scientific advancement and personnel necessary to make their enterprise successful, they must look to the quality of public schools in the community. I know of no greater contribution that the universities could make to your state's attractiveness as a center for location and expansion of high technology than to be serious about the business of assisting in improving public schools. I have a litmus paper test of just how serious a university is about its commitment to public schools. That is: How good are the public schools that are most proximate to that university? If there is an elementary school within a half mile of your leading state university and it is not a superior elementary school, how are you going to convince anyone that the university is serious about its commitment to public schools that are 400 miles away?

The second issue is technical training. I remember a conversation with officials of a microwave company in California who said the number one factor in where they would locate is the ability to get what they described as "the paraprofessional class of craftsmen"--the person who can operate and maintain highly sophisticated equipment, who can take the engineer's concepts and convert them to the assembly line in a profitable manner. They said that their greatest pool of people to meet that need were retired military, and that was where they were putting their greatest emphasis in recruiting. That's a pool which has served American high tech industry well, and I think this will continue in those areas of the country that have a large number of military retirees. But we also have to begin to expand the pool of our traditional entrance into high tech paraprofessional jobs. I think that in terms of higher education responsibility the key here is going to be the community colleges. I believe the community college is the ideal institution to prepare this paraprofessional person, who needs not only the immediate hands-on skills that we associate with a vocational school, but who also needs the skills of adaptation to be able to accommodate to the known fact of change and to the unknown of what exactly that change will be. And I believe the community college which can offer a combination of specific skill training and basic education in the adaptive skills is the institution to achieve that purpose.

The third factor is the issue of continuing education for scientific and management personnel. And I underscore the word <u>continuing</u>. We have a substantial surplus of newly-minted engineers. What we have a great need for is to be able to fill requirements of high tech businesses for maintaining the

professional competence of the firms at the same level as would be possible if these engineers were in Boston or Palo Alto. That says that you've got to be able to deliver that continuing education service on a client-based educational system, not a campus-based system. That is also a very important factor in this goal of growth management. I believe the key to a distributed high tech system is the emphasis on continuing education.

I believe that the Southern states have a great model to follow in how to achieve this distributed continuing education and that is in our agricultural programs. Most Southern states have within their land-grant universities a system of research, demonstration, and extension for agriculture. That is exactly what high tech industry is asking for from the universities, with particular emphasis on being able to carry that service directly to the community in which the industry is located. In Florida we have a system that we call Genesis II, which is now providing continuing education at the master's and doctoral levels in places like Melbourne, Florida, which is becoming a significant high tech center many miles removed from any state college of engineering.

So, those are what I think are the three responsibilities of higher education to a state trying to diversify its economy and manage growth through attractiveness for high technology--contribution to first class public schools, technical training for paraprofessionals, and providing continuing education at the plant site for the high tech industry.

Governor Robb. I will try to bat clean-up following Bob Graham and the excellent presentation from Battelle Institute and do my best to try to comment without being repititious. Following Bob Graham in terms of the governor's perspective on some of the things we ought to be doing is always difficult, and I agree with the basic premise of his suggestions on the things we ought to be looking for.

I did start to take issue at one point; we really don't have any divergence on this but I'll just use it to illustrate a point. Bob talked about concern with distributing some of the high technology and innovative technology growth in a reasonable fashion. One of the points that I'd make is that we have to be realistic about where we can distribute. A number of fairly unrealistic assumptions have been made from time to time as to where high technology growth can occur. The fact that an educational institution of higher education is critical now has become an accepted fact, but there were many instances early on where rural jurisdictions and others would put every hope on attracting some of this dynamic new high growth, high tech industry without making a very thorough analysis of what it was they had to offer.

I think this is one of the critical factors that has been frequently overlooked. For instance, we have had an explosion of high technology growth, particularly that related to communications research, in our northern Virginia area which, of course, is adjacent to Washington, D. C. We like to take credit for the fact that we have an extraordinary percentage of scientists and engineers with doctoral degrees in that particular area. We like to point out that there are really more high tech companies and high tech employees in that area than there are in some of the acknowledged centers that we've referred to. And yet, we can't claim any real credit for it. We discovered that they were there all of a sudden, and tried to figure out what it was that brought so many high tech firms to that particular area. It happened to have a lot to do with the fact that the federal government was there and they wanted to be close to federal contacts--this is really not a production or distribution center but in most cases has to do with the research component. But, it is something that has occurred over a period of time and some people obviously have worked very hard on that achievement. Still, we're now in a position of exploiting what occurred because of some of the factors that no one had really attempted to analyze in quite the same way that the Battelle report has analyzed them for us.

We're certainly going to take advantage of that high technology development in our state. We already have attempted to foster high tech growth. As a matter of fact, we got into competition with some of the other states without having any major university in the area. There is a desire to bring to a particular location any element of the equation that might be missing. In our case we were fortunate that we had a high concentration of crucial factors in place--a community life that is highly regarded, an excellent public school system, and accessibility to a number of major universities which, although they are good solid universities, are not as distinguished as those we have been talking about and none has much of even an undergraduate engineering program, much less one at the graduate level. What we tried to do in a very short period of time was to suggest that we would create a satellite institution that would involve a number of engineering faculty from the University of Virginia, which has an excellent engineering faculty, and Virginia Tech, which is another good solid engineering school, and co-locate that with the university in that particular region, George Mason University, which is a growing urban center.

I mention this because in assessing the usefulness of high tech development, in many areas we have not been very realistic about what we have and what high tech industries are looking for. Consequently, I'm going to make the Battelle report available to a number of our community development folks around our state because it will tell them in a fairly realistic way what high tech industries are going to be looking for and what factors are going to be considered.

One of the things that we have done in Virginia is to appoint a state task force on science and technology. We asked the group to, in effect, catalog the resources of the state, tell us precisely what we had in terms that we can understand and relate to, and then tell us what we're going to need to do to be in a position to attract some of this industry. That report is going to be made public in about a month. I asked the chairman of our major utility to head up that group so that he could bring to it the business and the generalists' approach, and had a number of university personnel and others in the scientific and engineering community participate. We have developed a number of proposals to work on that we're going to be acting on in our next session of our legislature. Something that all of us have to do is to back up our convictions and our suggestions with dollars. Right now, in the development of our budget, we are setting aside monies that are not clearly designated for a particular high tech project but can be used to help finance some of the innovative suggestions and recommendations that are going to be created as a part of this task force report. I have asked the education and the commerce and resources departments--each compete for a sizable block of money--to suggest ways that they can cooperate to bring about the realization of the budget preparation for economic growth activities. It seems to me that it makes a great deal of sense to set the needed money aside ahead of time and set the goals in accordance with our objectives.

Another thing we have done is to identify the major resources that we have right now in higher education. We're bringing key personnel from those universities together, through both telecommunications and physical transport, to interact, particularly in regard to the awarding of research grants and the coordination of research projects for both the public and the private sector. We're also creating centers in various regions in the state to give us the added dimension, the added component in high tech fields, a major academic focal point for expertise that simply doesn't exist at this point.

Those are some of the things that we're doing in Virginia to try to enhance our potential for both economic development and high tech expansion within our borders. It seems to me it starts, in addition to all that Governor Graham has alluded to, with a realistic evaluation, a critical objective analysis of what we have and the art of the possible. It seems to me we can keep our strategies on track if we're realistic about what we can compete for and what we simply can't compete for, and if we concentrate on those areas where we have real potential for growth.

INSTITUTIONAL AND STATE RESPONSES TO CHALLENGES OF HIGH TECHNOLOGY

D. S[illegible]lman, President, Microelectronics Center,
[illegible]earch Triangle Park, North Carolina

Thomas E. Stelson, Vice President for Research,
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Mr. Beilman. Let me explain first that I am not an educator; I am not a politician; and I am not a theorist. I consider myself a practical high technology businessman, who has had 30 years of experience with General Electric in related areas. I'd like to make a first point of something that is obvious and is also fundamental and imperative. Before we can figure out how to compete for each other for the distribution of growth of high tech industry in the United States, we must first of all figure out how to help insure that the U. S. is competitive in the international marketplace for technology-driven goods and services. If we don't have the national position and maintain our volume of activities, there isn't much to go around. Now that's one of the most fundamental problems I think we face, and that's not just a problem for higher education.

As Governor Winter said yesterday, we can't sit around and wait for things to happen; we must make them happen. Let's see what has been happening as we've been sitting around for the last 20 years. We are all aware that international competition has never been more intense than it is today. No longer can it be assumed that the United States is and will remain the primary economic force in the world. We now operate in a gold economy which is highly sophisticated and very competitive, and the leadership of the United States in this field is constantly challenged. In 1965, more than 60 U. S. companies had sales over $1 billion; only 27 other such companies existed worldwide--25 in Western Europe, two in Japan. Some 15 years later, in 1980, there were 301 U. S. companies with sales over $1 billion, but there also were 316 in Western Europe, 103 in Japan, and 35 in so-called "developing" countries. A drop of the American share in the "billion dollar club," so to speak, from 70 percent to 40 percent.

This challenge of U. S. international predominance is real, and it is growing. Many industries have already experienced severe effects from this global competition. You all know what has happened in such industries as steel, machine tools, textiles, apparel, automotives, and consumer electronics. Employment losses in these industries have been high, and employment probably never will return to former levels. It is generally agreed that competition in these older industries as well as the new high technology industries will center on the

achievement of technological innovation. Technology-driven innovation and its results improve productivity in existing industries. New products for existing and new industries will be critical to economic growth in the future. While it is the challenge of society in general, it is more specifically the challenge of the educational system to provide leadership in insuring that our population is technologically literate. This is not to say that we should ignore traditional curricula, but we must make sure that our society is as informed and educated about new technology as people must be for the United States to be internationally competitive for the long haul.

Technology increasingly is becoming a part of our everyday life, and we must learn how to take advantage of this fact. New technology has never before been asked to resolve so many new requirements. Nearly everyone is counting on high technology to help solve current economic problems by encouraging new businesses, expanding existing high tech industries, and revitalizing older established industries. The competition to attract this economic vitality to each state, county, and city is intense. While I agree with those who predict continued growth in high technology and their peripheral service groups, the fact is that this growth will not be evenly distributed among cities and counties within each state, much less among all the states. So the questions are: Where will high technology firms locate? What can universities do to support locations in these areas?

There have been several recent studies of how high technology firms pick a location. Highest on the list of factors affecting location is the availability of workers--professional, skilled, and technical. A second factor high on the list is accessibility to first-rate academic institutions. Unlike most traditional industries, the availability of a university of technical excellence is a critical factor in the location decision of high tech industry. Why is proximity to first-class academic institutions so important to high tech industry? First and foremost is the ability to attract and retain first-class professional staff and the availability of a skilled work force. Creating the intellectual environment necessary to support the human resource needs of high tech companies is principally a function of the first-class universities currently available to an area. Providing a source for basic research and nationally recognized researchers and, very importantly, providing for continuing education so that high technology people can maintain their currency and market value are all necessary contributions from our universities to high tech industrial development.

Growth in high tech industries, specifically microelectronics (what I prefer to call modern electronics) has been most dramatic in California's Silicon Valley and Massachusetts' Route 128. In both of these areas, as everyone knows, there was a strong link to major research universities for the conduct of basic research and the supply of trained personnel. There have always been

close ties between Stanford, UC-Berkeley, and Silicon Valley industry. The same has been true between MIT, Harvard, and the Route 128 industries. The attraction of high technology industries to Route 128 and Silicon Valley has led to tremendous economic growth in both these areas. About 23,000 new high tech jobs a year are going into those two specific locations. There's an obvious phenomenon worth noting: like companies often cluster in specific areas. There are several reasons for this, but they are all basically related to the creation of a "critical mass" of talent--in this case, research capabilities and facilities that are necessary for high technology industry.

Let's look at what individual areas can do to help attract high technology industry and its related economic growth. A first reality is that it pays to be selective. That is, not everyone is going to be a winner in attracting all segments of high tech industry. This is a highly competitive business and yours is not the only institution or area that would like to become a major support center for high tech industry. Competition is already intense and will continue to become more so in the future. Individual institutions will not be equally supportive or attractive to all high technology companies, which brings me to a second and corollary reality.

It is important to identify what high tech industry you are going to attract. Areas or states must be totally objective as to what segments of high tech industry you can attract to your region. By the way, one of the least agreed-upon terms is "high technology industry," but one thing is agreed upon: high tech industries generally are more dependent upon technological innovation and, therefore, require greater use of scientists and engineers. However, this still leaves a lot of room for interpretation. The Bureau of Labor Statistics recently came up with a definition of high technology that includes only 36 industrial codes (out of 977) where research and development expenditures and technical employees are twice the average.

A third reality is that only limited financial resources are available for staffing and equipping the state-of-the-art professional schools. Really first-rate professional technical schools are expensive, and getting more so all the time. Attracting expert staff and maintaining state-of-the-art equipment is exceedingly complex and costly. As technology advances and continues to accelerate, laboratories and related equipment become outdated more quickly, and the leadership challenge grows exponentially.

A fourth and readily apparent reality is that only limited human resources are available and competition is intense between universities and industries. Human resources are clearly the critical component of high tech industry as well as the university involved. Scientists and engineers are in high demand by both the academic and business communities, and substantial shortages

already exist in areas such as computer science. Future shortages are predicted: 15 percent for computer specialists, 10 percent for electrical engineers, and you know better than I do that some 25 percent of faculty positions in engineering are unfilled.

A fifth reality is that working together to achieve a common goal is sometimes not only preferable but absolutely necessary. Sounds simple but it has not been so in past university environments. I had the opportunity to spend about 10 years with one of the failed industrial parks up North, and where they thought it was going to be a success, it turned out to be exceedingly difficult. We have been brought up in a society which encourages competition, but this is clearly not the best course with limitations on resources. Competition among universities for limited human and financial resources can very well lead to mediocrity rather than excellence.

A sixth reality, and a real plus, is that modern communication opens up new avenues of cooperation among universities and between the academic and business communities. Modern technology can be a facilitating element for educating society and for nourishing economic growth. Modern communication technology opens up new opportunities for universities as well as businesses to share scarce resources more effectively and make technical excellence also a reality.

A seventh reality is similar: high tech firms tend to cluster around one another to take advantage of existing technical support structure. In high tech industry it is necessary to create a "critical mass." This critical mass cannot be created everywhere, because of limited human resources. The base developed by universities is supplemented by additional resources brought by clustering similar businesses and supporting industries in an area.

An eighth and final reality--the levels of excellence necessary for this country to stay competitive internationally can only be achieved through new partnerships with government, academia, and business.

I would now like to relate to you some of our experiences dealing with these realities in North Carolina. North Carolina's strategy for economic development is a consistent one. It started over 25 years ago, with the establishment by the triangle universities of Research Triangle Park. One million dollars in seed money has led to what is nearly $1 billion dollars in investment. Now, Research Triangle Park is a nationally recognized success story of diversified economic growth based on technological applications. The Park has put the state in an excellent position to capitalize on the next phase of high technology growth. I might digress just a moment to say that Research Triangle Park is, indeed, a scientific park; the private and public covenant precludes

very limited production related to the scientific activities, and I think represents an excellent model for others to look at as it relates to science and industry development.

North Carolina's approach to economic development over the past 25 years has been characterized by farsighted convictions and aggressive attitudes on the part of public officials, universities, and private industries. Our strategy for high tech economic development is a bold initiative resulting from strong leadership provided by our governors, university presidents, the Research Triangle Park scientific community, and, most importantly, the state legislature. The commitment of state funds to establish a center of excellence in microelectronics research and development demonstrates political and intellectual courage. The state has already appropriated about $25 million and an additional $17 million has been submitted in the budget for 1984-85.

Another critical element of North Carolina's high tech industrial development strategy is the extensive system of community colleges to support the need for a highly skilled work force. The North Carolina community college system has 58 campuses; there is a campus within 30 miles of 90 percent of the population of the state. It represents a very substantial investment in human and financial resources essential for economic growth of manufacturing across the state.

The North Carolina Microelectronics Center was, in fact, conceived to provide the vital link in the state's long-range strategy for economic development based on leadership in what is best described as "modern electronics," and the broader categories of high technology industry. Let me digress a moment. High technology is a very complex segment of the industry and, as we look for an area in which to make an investment, we try to find one set of technologies that is really pervasive to all the high tech industries. It turns out that microelectronics is clearly the one ubiquitous kind of a technology that we see pervading all high technology industry. When you look at microelectronics you tend to think of integrated circuits or semiconductor manufacturers, but, in fact, the strategy of North Carolina is to attract a wide range of industries. My guess is that integrated circuits will be a minor portion of the industry attracted to the state; rather, the industries that come to North Carolina will be those who use it--telecommunications, instrumentation, medical electronics, and the computer world.

The Center that we have in North Carolina is designed to achieve two intimately related major objectives. The first is to establish a nationally recognized technical environment in modern electronics conducive to the infusion of technology into existing industries and the location of new industries in the state. The second is to support a significant increase in training and education at the participating universities in order to provide industry with its

most critical resource, highly competent people. To accomplish this goal of educational excellence in high technology, the activities of the Center will support the education and research missions of the six participating institutions--The University of North Carolina at Chapel Hill, North Carolina State University at Raleigh, North Carolina A&T State University in Greensboro, Duke University in Durham, The University of North Carolina at Charlotte, and the Research Triangle Institute in the Research Triangle Park.

To carry out its mission, the Center provides advanced state-of-the-art integrated circuit design and fabrication facilities that will be shared with our participating universities and will also avoid unaffordable duplication of these very costly facilities. The principal scientific responsibility will be to encourage basic research among the participating institutions linked to applied research performed at what is being structured as an industrial research center with in-depth industry involvement and support. The Center also provides research grants and fellowships to augment university efforts as an integral part of the overall program of technical and educational excellence.

Another important element in the state's technology strategy is to establish a new and powerful communications network, now in the prototype stage. This high speed data and television network will link the Microelectronics Center with its participating universities to foster interaction between geographically dispersed scientists, and to distribute and share advanced coursework and allow remote collaborative use of the most modern lab equipment and computer facilities. In the near future this network will be used to link existing and new companies as well as educational and research facilities in the state to encourage the availability and aggressive utilization of advanced technology by all our industries and academic institutions. These education, research, and communication investments and activities are key structural elements of the technical environment needed to attract electronics and related industries to the state. The strength of North Carolina's economic development strategy in general, and specifically the Microelectronics Center, is that it is focused on the strengths of the state and existing realities. Summarizing some of these strengths and realities may be of interest to other states and universities in developing strategies that best meet their situation.

Microelectronics, or modern electronics, is the focus of North Carolina's strategy for several reasons. North Carolina already has a strong base of employment in modern electronics--close to 200 manufacturing facilities and over 70,000 jobs. By developing a world-class research and development capability, North Carolina can leverage that strength, which will lead to additional clustering of electronic firms. Modernization of existing traditional industries, such as textiles, will depend on modern electronics for future improvements in productivity.

North Carolina universities already have strong programs in computer science and electrical engineering, but, like every other state, North Carolina has only limited resources for the development of research and educational excellence. Several of the predominant research enterprises and universities in North Carolina have been talking about a microelectronics program for a number of years, but there were not sufficient funds available. Each university wanted to develop its own major program, and was considering a whole program, not just a part of one. Working together was the only way they could develop a total world-class program. Now, each professional school benefits from the others by sharing equipment, facilities, and staff. The development of world-class capability in any technology is ultimately dependent on human resources. Any field has a limited amount of talent available. The six participating institutions, plus the new Center itself, allow for the development of a "critical mass" of professional talent--currently about 150 in microelectronics--that could not be developed individually. I might also tell you that we have a little over 5,000 undergraduates who are working in areas related to microelectronics; of 900 graduate students, 450 are directly in the field of microelectronics. That has happened almost exclusively in the last three years. So there's been a major change in the overall character of the educational program and the talent in the area.

The cost of world-class programs requires new and bold partnerships in order to accumulate the resources and talent necessary for success. The North Carolina microelectronics program allows for joint funding and the sharing of technical talent among the three sectors of government, education, and business. Economic growth in the attraction of high technology companies is a high-stakes game. The effective use of the major research universities in this country are critical to develop the human resources to support the necessary excellence in advanced technology. How each state and the supporting universities choose to support each other greatly affects the degree of success attained. This is a highly competitive field and the individual states' success will depend upon being realistic with long-range planning, perspective, and commitment.

Let me conclude by commenting that while there is much discussion about how to be successful in attracting high tech industry to your state, there really is no cook book approach. As with any major business development, success rests on a few basics: business acumen on the part of state chief executive officers and a few other leaders; the incisiveness to build on well-established strengths; the elusive, but clearly apparent, individual and collective vision of the future for a state and an area; and finally, the ability to translate vision into firm convictions, clear plans, and bold actions. The key to success is, as always, leadership--individual leadership by state and local government officials, universities, and equally important, leadership and support by the business community. You remember the old saying, "If you can't sell it, nobody will buy it."

Dr. Stelson. I am delighted to be with you this morning to tell you a little bit about the Advanced Technology Development Center (ATDC) at Georgia Tech. It's essentially a catalytic organization at the present time, and so when you're dealing with a catalyst, it's important to know about the other elements with which the catalyst interacts. For example, at Georgia Tech the ATDC budget currently is 1/4th of 1 percent of the university budget. So, as one of my responsibilities, it is less than 1/2 percent of budgetary activity. But it is already, I think, spectacularly impressive in its activities.

First let me tell you a little bit about the industrial, particularly the high tech, conditions in Georgia. Unemployment in Georgia at this time is 3 percent below the national averages, and this is in spite of the fact that the two major employment categories, textile and Ford products industries, have substantial reductions in employment from previous levels. Most of this economic success is in high tech industries, although most people in Georgia don't know this. These industries are not focused geographically, as they are in Silicon Valley or Route 128 or Research Triangle. Rather, they are broadly scattered across the state. There are major high tech industries in Savannah, Douglas, Albany, Columbus, and Macon. In fact, just south of Macon, Warner-Robbins Air Force base has an annual budget of $2.5 billion of extremely high technology. So, in many respects, the state is already a leader in high tech industry, but the development is more diffused than you might see elsewhere.

One of the primary threads in all this industry is that almost all of it relates to Georgia Tech in one way or another. Let me tell you a little bit about Georgia Tech. We have 11,000 students in only four program areas--engineering, science, management, and architecture. Seventy percent of the students are engineering students. The student body in engineering is of very high quality; one-twelfth of all National Merit Scholars in the U. S. now come to Georgia Tech, and one-fourth of all National Achievement Scholars in engineering come to Georgia Tech. This has been the case for a long time.

The main change in recent years is the research activity. Ten years ago the external research funding was $8 million; today it is $80 million. The research also is very diversified. At any one time there are about 1,200 active contracts, and each month we turn out about 160 proposals in search of research funding. In engineering research we are now the third largest operation in the U. S.; 10 years ago we were twenty-sixth. Research is a very elitist business. All of our research funding is obtained in national competition with all other institutions in the country, so it goes through a rather severe refining process. And industry has rather great confidence in the quality of research because of this refinement. Furthermore, there's one characteristic for the Georgia Tech research program that is rather unusual--20 percent of the research funds comes from industry; the national average among universities is under 4 percent.

So we have far more interaction with industry than does the normal university, partly due to the fact that we are predominantly an engineering institution.

In recent years, as the research program has increased, we have had dozens and dozens of industries flocking to Georgia Tech to talk to us about research. As I said, research is an elitist business. It is pretty hard to build a business, a commercial business, on second-rate research, so industry goes wherever it's necessary to be able to interface with first-rate research. The competition for excellence is critical, and we excel in perhaps 25 areas of research now. Industry comes to interface with us to fund, to send students, and to license our technology.

Of the industries that have come in the past, we have reacted in what I would call a passive way. When an industry would call us and ask us to come for a visit, we would visit with them and try to accommodate whatever their wishes were. But we had no strategy for industrial development; we took no aggressive position. The thing that's different about the ATDC is that now we have a small amount of resources, we have a strategy, and we are assuming an aggressive rather than a passive role.

Let me tell you what the ATDC does. It has been operating on a current budget of $400,000. It has four staff members and support functions and personnel. It has four primary goals: (1) incubation of new industry; (2) recruitment of industries; (3) support of industry in an operational sense, that is, with respect to financial, legal, and managerial aspects; and (4) venture capital.

In the development of industry in an area where industrial development is not a tradition, venture capital is probably one of the most crucial conditions. In Atlanta, until two years ago, there were no formal venture capital organizations. When you have to go to San Francisco or New York or Boston or Chicago for venture capital, you will find it generally unsuccessful because venture capital development is a chancy business. Those people who provide the venture capital like to look in on who they're funding about every two weeks, and they just won't go to the trouble of flying from New York to Atlanta every two weeks to check up on their development organizations. We now have two venture capital activities in Atlanta. We run perhaps the most successful venture capital contract by bringing together financial interests and fledgling industries. Those industries make presentations to support their funding requests, and typically, about half of them are funded. We've come off the ground and have had a small amount of success in that area. Incidentally, our venture capital advisory committee has every other meeting in San Francisco because the travel expenses for a meeting in San Francisco are less than the travel expenses for meeting in Atlanta, meaning that we have more members from San Francisco.

The incubation is a more novel idea, although not that novel around the country. We have under construction a $5 million building, two-thirds funded by the state of Georgia, one-third funded by research activities in Georgia Tech. It will have 8,000 square feet, and will house perhaps 20 to 30 incubating industries. These would be industries, in high tech that's the common terminology for companies, that would stay there one to three years with full access to the support facilities of Georgia Tech--the library, computing center, inventories, faculty--and we would treat them as an internal element of the university. This enables the small, weak industries to have access to powerful facilities without the necessity for front-end capital and with greater convenience than if they would go elsewhere. The building is to be finished this summer, but in the interim period we have rennovated the basement of an old building.

We currently have seven of these small industries in residence on the campus, and we are working with others that are not in residence on the campus. We realized that residence on the campus was not necessarily desirable, so we also provide internal support services for those industries that are located elsewhere. We have an advisory committee that reviews and analyzes the business plan of each of these industries, and, on the basis of a recommendation from our advisory committee, we admit an infant industry to the program. Some of these companies have two, three, or four persons, and our largest one currently has eight people. So, I'm not talking about enormous start-ups. In fact, one of the problems with these small industries is that not only are they unbalanced and weak, they aren't big enough to attract attention. If you're recruiting a new industry that's going to hire 500 or 1,000 employees, everybody's interested--the banks, the state, realty firms--and you have no trouble mobilizing teams to work with that recruitment activity. But if you have one-half person or even five people, it's very hard to get a bank interested. And furthermore, if you tell a banker, who is used to financing land and buildings and maybe production equipment and inventory, you want to invest significantly in software or you have this little package of microelectronic chips worth $2 million you'd like to borrow on, you have a big gap in understanding with the traditional community support.

Unlike big industries that hire consultants to give them advice and write reports and go through deliberate decision processes, these small industries don't waste much time or effort on these decision processes. And, if the principal person likes to ride horses in the morning, the industry is very likely to be located next to a place where you can ride horses in the morning, irrespective of all the other things. My over-riding criteria is that everyone is different and you find out what appeals to each one and accommodate them in that way.

Let me just comment briefly on some of the things Georgia Tech does operationally that are attractive to industry. In addition to what are probably the most comprehensive engineering programs in the world, twice as many accredited programs as most schools, we have 2,300 co-op students. This offers a tremendous mechanism for interfacing with industry. We offer a full set of evening programs. And, one unique thing, we will deliver media-based instruction in engineering at the graduate level anywhere in the state of Georgia; we currently deliver it in 64 locations. A company can locate in Milledgeville, for example, and we can provide "on location" not only our engineering graduate programs for credit, but we also manage a national system and can furnish graduate courses from 22 other prominent engineering institutions--not for credit at Georgia Tech, but for development if they so desire. This is a good delivery system at the most critical level, and it is a most difficult thing to achieve locally.

Another thing that we do that's unusual is to undertake confidential research for a company. We never take it without a positive recommendation of the faculty member who would supervise the research. But, industry, particularly high tech industry, has various kinds of secrets which they cannot afford to have broached because it would damage their business positions. So we will work on a confidential basis. We have done this for many years and we find it is not a serious impediment to academic operation. Incidentally, we also take on classified military research and do not find that a serious problem either. Let me point out that most of our classified research is classified simply because of the need for access to classified information. There's nothing in the operation that's classified in any way. And, instead of dealing with generalities, it is better to study specific situations and make decisions based upon particular knowledge.

Another thing we do is to license technology, which is currently about $1 million a year in income to Georgia Tech. We do about 50 or 60 disclosures a year and we pursue about 20 to 25 patents. We also license trade secrets, probably more than any other institution in the U. S. To do this, you need a special set of capabilities to handle trade secrets, but they are a critical interface with industry. Industry is very supportive of our position in doing that.

Another thing we do a lot of is to become a partner with industry in much of our research. Georgia Tech has a very well-defined boundary. We provide education, research, development, and technical assistance. But we do absolutely no manufacturing, no routine testing, and whenever we can move activities at Georgia Tech into industry, we do so. Our industrial partners like this policy position, and several of the industries we've started have been as a result of this kind of research problem. Recently, for example, we built a one-of-a-kind, highly sophisticated, electronic device for the military. They were delighted with it and wanted us to build 10 more. We said, "We don't do that;

we're not a manufacturing organization." But, we went around and found somebody to do the manufacturing, and started a new industry, which now has its first substantial contract. We have done that a number of times; it has helped us and is a mechanism for starting new industries. So, we have well-defined policies that frequently interface with industry on a cooperative basis. For example, we will do some analysis and we will be a partner with industry in the fabrication of a piece of equipment. Industries like this because they make their money not from the sophisticated analysis, but from the manufacturing end of it. They are getting experience in the areas where they have the greatest opportunity, and we are getting support for the kind of functions that we like to be involved in.

The ATDC, then, is primarily a catalyst, and it is built around the research programs of Georgia Tech. But also I would point out that one of the industries located on the Tech campus is a spin-off from Emory University, actually, a mixture of Emory University and the Center for Disease Control (CDC). We also are open-minded about operation with other institutions in the state, or outside it. Georgia Tech has 35 professional employees in Huntsville, Alabama, and 14 in northern Florida. We have offices in Ireland and in Kuwait, Cairo, and in Khartoom. We would operate wherever it is intellectually exciting and where the economic opportunity is attractive. This aspect of our operation is attractive to high tech industries because essentially all of them operate worldwide. Provinciality is not a characteristic of high technology, but global activity is; hence, industry prefers to interface with the university that also operates on a global basis.

SKILLS FOR THE WORK PLACE IN AN ERA OF HIGH TECHNOLOGY: MYTHS, REALITIES, AND IMPLICATIONS FOR EDUCATION

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Some of what I would have wanted to say has already been said; I'm not going to try to repeat it. What I want to do is to introduce what I hope will be a note of caution and balance on the high technology phenomenon. I'm emphasizing this because of what has generally been said by politicians, by the national media, and by people.

I have lived in Silicon Valley and have been at Stanford University for 15 years, which is virtually all of the period of development in microelectronics. I find interesting the rest of the country's perception of how the developments took place there; it is also interesting to see how people in the Valley see themselves. Let me just give you a couple of quotes. Recently there was a conference on entrepreneurship at Stanford, and a large number of the people making presentations were from or were associated with Silicon Valley. One of them, Nolan Bushnell, was the developer of one of the first video games, the PONG game, which eventually became the basis of the large Atari firm. In his talk, Bushnell started out by saying how high technology is going to create more leisure, will eliminate poverty in the world, and so on, and then he said, "As early as 1987-88, America may see the Gross National Product (GNP) booming ahead at 15 to 18 percent annually, with tremendous labor shortages that can be solved only by opening up the Southern border." I should remind you that in the Sixties, the decade of most rapid economic growth of the postwar period, the average annual increase in the GNP was about 3 percent. I should also mention that Japan, with its very rapid rate of increase, averaged about 6 percent. And those of you who know mathematics know that when you see growth like that, exponentially, you're talking about fairly rapid growth. As for 17 or 18 percent, at no time in modern history has any industrial country come even close to that kind of figure. And yet very quickly in Silicon Valley they have this enthusiasm about what has happened.

Let me just add one other quote, which I think is interesting, from William F. Miller, who is the president of SRI International. (Contrary to what was said yesterday, SRI is not a part of Stanford University and has nothing to do with Stanford Industrial Park in Silicon Valley. It was started by the Stanford trustees in the postwar period, and then spun off and is completely independent of Stanford and the industrial park. It is not located

geographically in Silicon Valley; it's located a bit north of the Valley.) Mr. Miller said, "Every time you destroy jobs, you improve the welfare of the nation." That's a quote. He went on, "What we're engaged in as entrepreneurs is creative destruction of established industries." And Bushnell jumped in and said, "That's right, jobs should be thought of as transitory phenomena." That's an interesting point of view; I've never thought of myself as a "transitory phenomenon," nor have my wife and four children.

The important point here is that there is an awful lot of excess in terms of what the future of high tech is going to accomplish. I would like to focus on that and then discuss the question of education and skills within that context. I think that this is important, because we heard yesterday that the Battelle Institute says 60 percent of new jobs will be in high technology. In California--which certainly in terms of the number of jobs in high technology is the most advanced by anyone's definition of that term, and definitions vary--the Department of Employment in Economic Development came out with an estimate for 1980 that about 8.5 percent of the jobs in the state were in high technology. If we were to neglect non-high technology areas and focus on that, we'd be ignoring well over 80 percent of the jobs in the state. As for 60 to 80 percent of all the jobs in the future going to be high technology, our department saw only a slight gain, a few tenths of a percentage point, between 1980 and 1985. And, indeed, the national data confirm those kinds of estimates.

I think it's very important to make the distinction, as SREB does, in its publication, Technician Manpower for the South: High Tech Industries or High Tech Occupations?, between high technology industries and high tech occupations. It's a very important distinction. In Silicon Valley a great many jobs are created by so-called high technology firms--you see that all over California. But what is the typical person doing in those firms? The typical person is not working on microelectronics at the frontier; in fact, is not even familiar with microelectronics. The average person is an assembler or clerical worker in those firms; 80 percent of the employment in Silicon Valley is employment which requires no skills beyond a high school education, it's assembly work. We have to be very careful not to assume that firms that are involved in high technology employ only persons who are deeply involved in high technology and have high levels of skills.

High technology firms usually include three major areas: microelectronics, robotics, and biotechnology. And when we refer to the occupations that comprise high technology, we usually refer only to those that are scientific, engineering, and at the technical level just below the higher level ones. But these positions seem to be at roughly 20 percent of total employment in high tech industries, which has been confirmed on a national basis by the U. S. Bureau of Labor Statistics.

It's extremely important that we make the distinction between the phases of high technology industry: (1) basic research and development (R&D) work, (2) getting into initial production, (3) getting a product into mass production on a fairly automated basis, and (4) the phase none of us wants to talk about--where the jobs are so automated that you can use very very low skilled labor in third-world countries. Atari found out about that rather quickly and was able to set up production and move it to Asia within a four-year period at a cost of 1,700 jobs in Silicon Valley.

Now let's look at places that are getting high technology firms. San Antonio, Texas, has been in the national media as one such place. San Antonio has a very enterprising mayor who set out a San Antonio Industrial Park and has been extremely successful at attracting firms there. But there's very little major development going on in San Antonio. Most of what is going on is basic assembly work. The vast majority of workers, far more than 80 percent, are in the $3.50 to $4.25 an hour assembly range. NBC did a story on high tech in San Antonio and asked a plant manager how much education he needed to work in this plant. The manager held up two screwdrivers, one a slotted screwdriver and the other a Phillips head, and said, "Can you tell the difference between the two of these?" The reporter said, "I can." And the plant manager said, "You can work here; you have the skills." It's important to realize that high technology has a whole spectrum of activities. For example, in food processing very advanced approaches from the biological and chemical sciences are being used, but that should not blot out the fact that the vast majority of people in food processing are very low-paid workers with virtually no skills at all who don't even need a high school diploma. We should bear in mind that attracting high technology firms to an area does not mean that the industries are going to have the same character as those in Research Triangle Park or in Silicon Valley or Route 128, or some of the other places where there's been development on R&D, incubation of new ideas, and new work. All phases of operation are characterized as high technology in the national media and by some of our national politicians who talk about the hopes of the future.

Let me just mention briefly, now, what the data seems to say about employment in high technology occupations. I think that's a more meaningful category than high tech industries if we're going to talk about skill and educational requirements. If we're going to talk about generating more employment, which is very important, we then might want to talk about the employment that can be generated by high technology industries. But, we want to be wary of what kinds of employment are being generated, rather than assuming that all employment will require high levels of education and skills and universities nearby and extension courses and so on.

One of the confusions that I've seen in the national press is that reporters tend to confuse the notion of the most rapidly growing occupations,

percentage-wise, with those that are growing most rapidly in terms of absolute numbers of jobs. For example, the U. S. Labor Department has estimated that between 1978 and 1990, the number of jobs in the U. S. will increase by about 23 percent. That's about 22 million jobs on a base of about 100 million in 1980. And if one looks at some of the jobs that are growing most rapidly in percentage terms, one sees that one of the top five jobs in relative growth, Data Processing/ Machine Mechanic, is growing at a rate of about 148 percent over that 12-year period. If one looks at numbers, though, one sees that the increase will be from 63,000 to 156,000 positions, or about four-tenths of a percent of all jobs. What we often forget is that jobs that grow very rapidly but start from a very small base don't account for a large number of jobs in an absolute sense in the economy.

If one looks at the top five jobs in terms of the fastest absolute growth from the individual state data collected, using quite different methodologies, this kind of ordering is quite typical--janitors and sextons, nurses' aids and orderlies, sales clerks, cashiers, waiters and waitresses. No high technology occupation makes the top 20 when one looks at the total number of jobs that are forecast to be created by specific occupations. Indeed, perhaps more shocking to an educator, only two of the top 20 jobs require anything beyond a secondary school education, and one of these is nursing in which it is possible to get a degree in two or three years, although some people do take a university degree besides. The other occupation requiring advanced education is that of elementary school teacher, given the increase in the demography of the young. Those are the only two occupations in the top 20 in absolute growth that require a college degree. If one looks at jobs like computer programmers, which doesn't make the list, one finds that the estimates suggest that we'll need about 150,000 new programmers in that period. But, according to the Bureau of Labor Statistics (BLS) estimates, we're going to need 800,000 fast food workers and kitchen helpers. So when one looks at the magnitude of the kinds of jobs that require high levels of skills and those that require low levels of skills, even with errors in the estimates, the disproportions are so great that it's safe to conclude that in 1990 certainly the vast majority of jobs created in this society will be low-skilled, not high-skilled, jobs. Indeed, even if we look at high technology industries that holds, because high technology industries create a lot of jobs that are very low-skilled jobs.

It is also important to point out that this has been going on for some time. McDonald's created more jobs in the 1970s than did our six largest steel industries, in fact, than the entire labor pool of the steel industry. One of the lessons that can be learned from this is not to write off our existing industries as sources of employment. There is a lot to say for trying to modernize, trying to go with their strengths, to see what is viable and move with it, even if it does not have the magic name "high technology."

Let's go a little bit further and talk specifically about the high tech transformation of other jobs. One argument is that as we apply microelectronics, microprocessors, robots, and so on to existing occupations, skill requirements will rise. That notion seems to come from the assumption that the more sophisticated the equipment an individual works with, the higher the level of skills required to work with that equipment. And, in fact, there have been estimates that by 1990, 60 to 80 percent of the population will be working with computers in some sense.

It does not automatically follow that because one has more sophisticated equipment it requires more skill to operate that equipment. A comparison of the Model "A" with 1983 cars points that out; the 1983 auto is vastly more sophisticated than the Model "A," but it is much, much easier to drive. James Bright of the Harvard Business School did a study in the 1950s on automation in a large number of industries. He was mainly concerned with what happened to "operatives" as they go from older technologies to more automated ones. What he found was that in the initial stages there's a learning curve involved for the worker and for the organization, but over time the organization is able to use the new technology to reduce work skills. That makes sense to the organization because it is making an investment. And, one of the reasons it is making an investment is to save labor costs, which is done two ways: (1) you reduce the number of workers you need; (2) you reduce the skill requirements of workers. Even if all that you've been able to do is to reduce the skill requirements of workers, you've reduced cost, which can be weighed against the cost of the new technology. That's important, because if you simply look at entrepreneurial behavior, it doesn't make sense to develop technologies to replace minimum wage workers. A $3.35 an hour worker in metropolitan areas is not expensive. You can get them and fire them; if you need more, you can expand their use. Why do you invest in anything in order to automate processes? In order to increase productivity. You do it where you're able to save very significant labor costs. So where do we find robotics being applied? We don't find them in yard work, raking leaves, sweeping the floors; it just doesn't pay. We find robotics on assembly lines in operative positions where, for example, the workers are in the $10, $15, $16 an hour range. It is in those areas the enormous investment that it takes to get into the use of robotics pays off. What I'm suggesting is that it is not in the entry level skills where you have the greater incentive to apply high technology, it is in the middle-of-the-skills range, the semi-skilled positions, the craft positions. That's where you're talking about real savings in terms of labor costs.

Now the reason that this is important is because there's been a lot of discussion about high tech raising the skill requirements of jobs, so let's be quite concrete about this. Some people automatically assume that computer operators, particularly if they're dealing with mainframes, are working with millions of dollars of very sophisticated equipment, therefore they need a lot

of education. It is well-known in the computer industry that computer operators need no more than a high school education plus a little on-the-job training. A computer operator is not a very sophisticated job; it's a very unsophisticated job. And even when we say that there will be a demand for large numbers of additional computer operators, it does not mean that there will be a demand for a lot of very sophisticated electrical engineers or computer science majors. How about the prediction that 60 to 80 percent of people will be working with computers? What does that mean? Well, as an example, that includes the checkout clerk in the supermarket who uses a laser reader on the UPC-striped items to record the price. That person is doing less work now--instead of punching buttons and calculating tax, all that is required is simply passing a little magic wand over a set of stripes on the product. That person is working with a computer. Or take the person who is in data entry, for example, simply typing in data for insurance claims. That person is working with a computer. Indeed, the vast majority of people in these estimates are working with a computer at that level. They not only have no knowledge of how the computer functions, but they need no knowledge, and would probably be frustrated if they had knowledge that got into the logic of circuit design and the nature of the hardware that they're working with. They're working essentially with a keyboard.

Word processing is another operation that fits into the category of occupations that are computer-related. Does it require a great deal more skill to do word processing than to work with a regular typewriter? Well, Manpower, a temporary agency for clerical and secretarial help, found that in one day they could introduce people to word processing, and those workers could be productive on the job on the following day. I should also add that secretaries no longer need to spell or do letter-perfect typing because corrections are easy to make and dictionaries are incorporated into the system which do a spelling check very quickly and automatically.

The important point is that we now have checked out some 30 to 40 occupations, and we find that, to a large degree, high technology applications are reducing the skill requirements of existing jobs. I can give a whole number of examples, but will just mention a few more. Today, legal research in larger law firms is done primarily by paralegal persons, with no more than 2 years of community college, who work with computers, using identifiers on particular cases, and do a library search for cases that seem to have these types of characteristics. That procedure is very rapidly replacing lawyers who in the past had to go to law libraries and look up the laws of different states to try to figure out strategies and precedents. Carnegie-Mellon, which has the most advanced robotics institute in the country, estimates that by the turn of the century, even given the existing capabilities of programmable robots, 3 million operatives will be replaced. Based on an extension of the technology by 2024, the end of the first quarter of the 21st century, there should be virtually no need

for operatives. Today we have about 7 million operatives in the economy. Advocates of CAD, or computer-assisted drafting, claim, with a great deal of evidence, that the draftsperson will soon be obsolete because of the kinds of software being developed and the precision of graphics devices.

Programming itself is very vulnerable; 20 years ago computer programming involved plug boards and machine languages; by 10 years ago, most programming was done in scientific and business languages. Today, a real market has opened up for doing computing where the user needs no knowledge of the computer whatsoever and no knowledge of any specialized language, but simply the language that he or she would use in his or her daily business. Apple Computer has brought out a machine that business people can be off and running with in 20 minutes because the operations for six major functions have been so simplified. That is the future. Markets open up when you don't need to have terribly specialized personnel and when people can use the skills that they already have in conjunction with the technology.

Our conclusion based on this is that the overall effect of high technology is going to be to reduce the skill requirements of vast numbers of occupations. This is not to say that there won't be some occupations that will have new skill requirements; there will, but they will be very small ones. The point is that in the past we had to limit the use of automatic processes to replacement of physical activities. We now have the ability to replace mental activities. To a large degree, the service economy is based on mental activities, and in one fell swoop, we can design software to replace tens of thousands of draftspersons and tens of thousands of clerical workers, and to downgrade the need for fully trained lawyers to do certain types of legal searchs. Our conclusion is that part of the overall effect of high technology in the future will be to downgrade the skill requirements of existing jobs to a far greater degree than to upgrade skills. A lot of the investment is going into occupations that have huge numbers of people involved because that's where the profits are.

What are other factors that might affect the forecast? Some people said, "Well you used BLS statistics and we don't know that these are right." However, there are no alternative sources of data that disagree with the BLS statistics; even when you make changes in the rates of economic growth, even when you make changes in the functions, the overall findings are that high technology occupations will not dominate the economy, certainly through 1990. We find that skill requirements to a large degree are being reduced and, in some cases, entire occupations will be displaced by the technology. Other occupations will emerge, but the evidence right now suggests that they will not create the number of jobs or jobs at skill levels that will come even close to the jobs that they're displacing. The main thing to keep in mind is the ability to displace mental labor through these automated programs; that enables us to replace or change the requirements for an entire class of jobs.

What are the factors that might affect these forecasts? Defense is one major factor; the defense budget is a real unknown. About 25 percent of scientific and technological personnel in the United States are working under defense contract. If the move is into large weapons systems, you're going to see over half the military budget in weapons systems. We'll move essentially from 26 percent to 51 or 52 percent in a very short period of time. If that happens, there will be an unprecedented increase in the demand for scientific and technical personnel, creating vast shortages just at a time when we seem to be turning out adequate numbers of engineers if you project the increases in enrollments over what seems to be necessary. That could change if those budgets come through.

Let me mention another factor. I hear again and again how we have to compete with other countries, and it's very important that we train our people properly to do so. What we forget is that right now the most important element in terms of jobs going overseas is not the Japanese or French corporations, it is the American multi-national corporations. Virtually any manufacturer of any size in Silicon Valley is producing microelectronic components in Asia, and American firms continue to transfer production overseas at a very rapid rate. The question is: How through education are we going to train people who are going to be so smart using very, very automatic kinds of processes to simply push buttons on technological equipment so that they are going to compensate for 50-cent to 75-cent an hour wages in Asia and relatively low transportation costs? There are factories in Indonesia that are using workers with four or five years of schooling, not because the Indonesian school system is so wonderful, but because the technologies of production have been developed to the point where you simply need disciplined workers going into the plant and following very simple orders.

Those are two unknowns that have not been taken account in the BLS estimates. One would suggest an increase in demand for high tech products and highly skilled workers; the other would suggest a very rapid shift of high technology, at least the production side, to other countries. It is bothersome to me to hear how we have to compete with the other countries when the most important factor right now are U. S. manufacturers shifting their operations to other countries, not because of the high quality of education those countries provide, but because the processes are so orderly that one can use very low quality labor at 50-cents and 75-cents an hour as opposed to $3.35 an hour. That's the dilemma.

What are the educational implications for a state? Well, let me mention a few of these that I think ought to be borne in mind. I think the first is that you have to think of education as having a wide variety of implications for different kinds of high tech industry. Some jobs will be predominantly low-skilled types of occupations; others will be at the opposite extreme. But even in the

Silicon Valley case we're talking about roughly 20 percent of the employment in the scientific and technical areas and 80 percent in the assembly and clerical/ service area.

Secondly, we can't predict the precise skill needs over the lifetimes of workers. Therefore, it seems very important that what we do is place our emphasis on basic skills. This is perfectly consistent with the policies of the Southern Regional Education Board. In Meeting the Need for Quality: Action in the South there's a very heavy emphasis on improving the quality of basic education--analytical and verbal skills, mathematics, and knowledge, as opposed to applied vocational skills at the secondary level. I think that we take an awful risk when we emphasize applied vocational skills at the secondary level because the requirements are going to change rapidly. Even when you change--as in some of our Northern cities--from steel manufacture or auto manufacture to electronics assembly, you change the skill requirements by enough so that, in fact, what has been learned is not terribly helpful. This is not to argue that electronics assembly requires a great deal of training. In California, typically you can measure retraining of auto workers for electronics assembly in terms of hours, not weeks, not months, not years. So we think it makes good sense to emphasize strong, very strong, basic education for everyone; to give kids the basic foundation to learn the kinds of specifics that they'll need to learn when they hit the job.

The final point that I want to make is that this society is not facing up to the larger fact that so-called "recurrent" education is going to become far more important in the future, and we're not prepared for it. What is recurrent education? Recurrent education refers to a situation some people would call "continuing" or "lifelong" education. I don't like those terms because they've been used traditionally in a very different way. Recurrent education refers to having education and work recur over a lifetime. Instead of stressing the idea of everyone getting his or her education before entering the labor force, the idea would be to get good strong basic skills before entering the labor force, either at the secondary or at the college level, and then, as one sees opportunities, to get the additional education for specific training. What would that need? Well, first of all, we'd probably need some kind of system of educational sabbaticals that would provide for people to leave the work place for a couple of weeks and sometimes for a few years to get additional education. There would have to be some kind of subsidy to make that possible, perhaps through social security or some kind of state system. We need a system of finance to make this possible because today most of the finance in education applies to the so-called "front-loaded" model, that is where you get all your education at the beginning. If you look at current financial aid systems, like federal loans and grants, these are much less available to people who are studying part-time or studying in non-degree programs than they are to those in the conventional fields.

Let me mention two demographic factors. As we stand today, over 75 percent of the workers who will be in the work force in the year 2000 are already in the work force. Thus, we're not going to get even a shot at them through the conventional methods of training--before they get there--because they are already in the work force.

The second thing is that if we're going to try to provide mobility so that the kinds of low-level jobs I've talked about are indeed transient jobs for the individual, we've got to provide some way over their working lives for individuals to get the additional training in order to get mobility to those better jobs. Even though those better jobs are not going to be there for everyone at any one time, it is possible over a lifetime for people to come into entry-level occupations and be able to move up through additional training to higher-level occupations. These mobility processes would be opposed to having a large portion of our population in low-level occupations for their entire lifetime. That, too, requires a system of recurrent education that's far more sensitive, far better planned, than the one that we have now.